

3.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

Chapter 3 provides a description of existing conditions for affected resources, and the potential environmental consequences that could result from the proposed SR-212/Telegraph Street project described in Chapter 2. Resource topics described and assessed in Chapter 3 include; land use, social impacts, economic conditions, air quality, noise, floodplains, water quality, wetlands, water bodies, wildlife, threatened and endangered species, invasive species, historic and archeological resources, hazardous waste, visual quality, and energy. Resources noted but not included in the analyses include farmlands and wild and scenic rivers.

For the purpose of describing the affected environment, the location and extent of the study area depends on the resource being evaluated. For the SR-212/Telegraph Street project, most resources were evaluated within the project area bounded by 500 West, 300 East, 100 North and 100 South. Some resources, such as air quality and economic conditions, required a broader study area, and are described in the individual resource section. Information about the affected environment for each resource topic was the baseline by which to identify and measure potential impacts of the project.

Impacts may be direct or indirect, cumulative, short-term or long-term, or beneficial or adverse, as described below:

- *Direct effects* are caused by the action and occur at the same time and place.
- *Indirect effects* are caused by the action, are later in time or farther in distance, but still reasonably foreseeable.
- *Cumulative effects* result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency or person who undertakes them (federal or non-federal). Cumulative effects are addressed in Section 3.22.
- *Short-term* impacts, for the purpose of this project, are those changes to the environment that occur during project construction. Construction-related impacts are addressed in Section 3.21.
- *Long-term* impacts are defined as those that would persist beyond or occur after project construction.
- Impacts can be *beneficial* (positive), or *adverse* (negative).

One of the statutory requirements of NEPA, and the purpose of this Environmental Assessment, is to determine if a federal action (the project) has a significant effect on the quality of the human environment. To determine significance, NEPA regulations require the consideration of both *context* and *intensity*.

- *Context* means the action must be assessed in several contexts, which will vary with each project, including society as a whole, the affected region, affected interests, and the locality.
- *Intensity* means the severity of the impact should include consideration of such factors as impacts to public health, affects to unique cultural resources, impacts to public lands or resources, impacts to endangered or threatened species, level of controversy, and level of risk or uncertainty.

3.1 Land Use

3.1.1 Regulatory Setting, Studies, and Coordination

The primary guide for land use and development is the 2005 Washington City General Plan (the General Plan). The following sections present an overview of the goals and policies in the General Plan that are most relevant to Telegraph Street and the project study area. Based on a review of the plan, it is evident that the City and its residents consider development and redevelopment in the downtown area a high priority for the future of the community.

3.1.1.1 Goals and Objectives

The General Plan contains a number of overall goals and objectives that focus on land use and development in the downtown area. These goals and objectives can be summarized as follows:

- Provide mechanisms for higher density, more affordable housing in the core area of downtown. (This area is close to developed infrastructure and existing goods and services, and enjoys good access via Telegraph Street. This would also add more pedestrian vitality to the downtown.)
- Provide mechanisms for the development of a traditional, pedestrian-oriented “downtown” on Telegraph Road between 300 West and 300 East
- Establish the city’s historic commercial area as an identifiable destination that appeals to residents and guests
- Promote the renovation and preservation of historic buildings throughout the city
- Move people and goods safely and efficiently to, from, and through Washington City, while minimizing negative impacts on adjacent land uses
- Maintain a pedestrian-friendly setting for residential neighborhoods, downtown shopping, and business districts
- Anticipate future bus route needs in the planning and design of streets and developments

- Provide walking and bike paths/lanes in an interconnected system that links major destinations

3.1.1.2 Land Use Plan Elements

The Telegraph Street project study area is contained within an area designated by the General Plan as “Historic Downtown Commercial (Mixed Use) (HCom).” This designation is intended to promote a pedestrian-oriented “main street” commercial area and is specifically targeted for the Telegraph Street, historic downtown area. It encourages a mix of uses, in the form of retail shops and offices, combined with residential uses on the second level. Chapter 8 of the General Plan establishes Sub-Areas for which specific policies and actions provide direction for implementing the General Plan. The Telegraph Street project study area is contained in *Area 1: Downtown – Telegraph Road/Milepost 10*. Area 1 consists of the historic downtown and the regional shopping center known as Milepost 10. Following is a summary of Area 1 policies that are relevant to the Telegraph Street proposed project:

- Encourage development of a traditional, pedestrian-oriented “downtown” on Telegraph Street between 300 West and 300 East with an array of stores, restaurants, offices, residences, civic uses, and trail connections
- Encourage infill development and redevelopment with a mix of commercial and higher density residential uses
- Encourage development of the Historic Downtown by assisting in the assemblage of land, sharing in the cost of streetscape improvements, and facilitating a simplified approval process
- Balance traffic efficiency with pedestrian-friendliness and commercial objectives in the design of Telegraph Street
- Maximize direct road connections from the surrounding communities to the downtown
- Encourage development of vacant lots in the existing town core for alternative housing types and multi-family dwellings
- Rezone areas adjacent to the Historic Downtown for medium- and high-density residential uses to provide the “critical mass” needed to support local businesses
- Work with the Utah Department of Transportation (UDOT) to ensure that context-sensitive design principles are used in future improvements to Telegraph Street
- Obtain options and/or first-right-of-refusal to secure key properties on Telegraph Street to help facilitate the development of the downtown area
- Install attractive medians, street trees, sidewalks, street lights, and other amenities in conjunction with the future widening of Telegraph Street

3.1.1.3 Appearance, Form and Character

Chapter 10 of the General Plan addresses goals and objectives for the city's physical appearance and its relation to enhanced opportunities for economic development. The chapter focuses primarily on the historic downtown and contains policies that focus on downtown character, historic preservation, and design guidelines.

Downtown Character

The General Plan recognizes that most successful shopping areas follow a simple formula: people on foot spend much more money than those in cars. Thus, the objective is to attract people, get them out of their cars, create an attractive setting that encourages them to linger, and provide exposure to numerous stores. The overall objective is a downtown that generates pride and attracts residents and tourists through its traditional buildings, shops, and restaurants, as well as its overall beauty. Specific strategies for enhancing the character of the downtown include:

- Provide a mix of uses that create a variety of reasons to come to the Historic Downtown
- Create an attractive, entertaining environment with amenities for all ages (benches, play areas, gathering areas) that are linked together.
- Develop a distinctive, consistent image/character for the downtown
- Provide zoning incentives to encourage office and residential development
- Provide off-street parking that is convenient, free to the public, and safe
- Encourage the use of ground-level space for retail uses, with upper floors used for office or residential uses
- Promote a pedestrian-friendly atmosphere through the use of narrow street widths at street corners, sidewalk paving accents, coordinated street furniture, and street trees or shrubs

Heritage Preservation

The General Plan recognizes that Washington City is an important pioneer settlement with one of the most unique histories in Utah and a special collection of historic resources. These include many buildings in the Historic Downtown area and several other individual properties scattered throughout the community representing early stages in the community's development, including early pioneer properties. Preserving historic resources is a part of an overall strategy of maintaining community identity and livability. Key policies include:

- Support and encourage the preservation of Washington City's heritage through education, incentives for preservation, and regulations
- Develop guidelines for the renovation of historic structures
- Complete a detailed survey of the city's historic resources

- Establish a coordinated preservation program

Design Guidelines

The General Plan calls for design standards to be developed for the Historic Downtown that provide context-specific direction for development and that reinforce the community's vision for the downtown. Relevant design policies for the Historic Downtown include:

- Foster a public streetscape in the Historic Downtown that enhances the pedestrian experience without being an obstacle to traffic or commerce
- Promote the use of trees and flowering plants in the Historic Downtown
- Enhance the pedestrian experience with site lighting at night
- Minimize the visual impacts of parking lots
- Orient building entrances to the street to encourage access by pedestrians along the public sidewalk
- Orient signs in the Historic Downtown to pedestrians as much as automobiles
- Encourage architectural detail that help to establish a sense of scale and provide interest to pedestrians

3.1.2 Affected Environment

The project study area extends from 500 West to 300 East along Telegraph Street. This is also the area designated by the General Plan as Historic Downtown. The study area is bounded generally by 100 South on the south and 100 North on the north. Zoning in the project study area includes both commercial and residential, with a few parcels of undeveloped land (**Figure 3.1**). Most of the parcels fronting on Telegraph Street are zoned commercial, while those fronting on 100 North and 100 South are zoned primarily for medium-high-density or high-density residential uses.

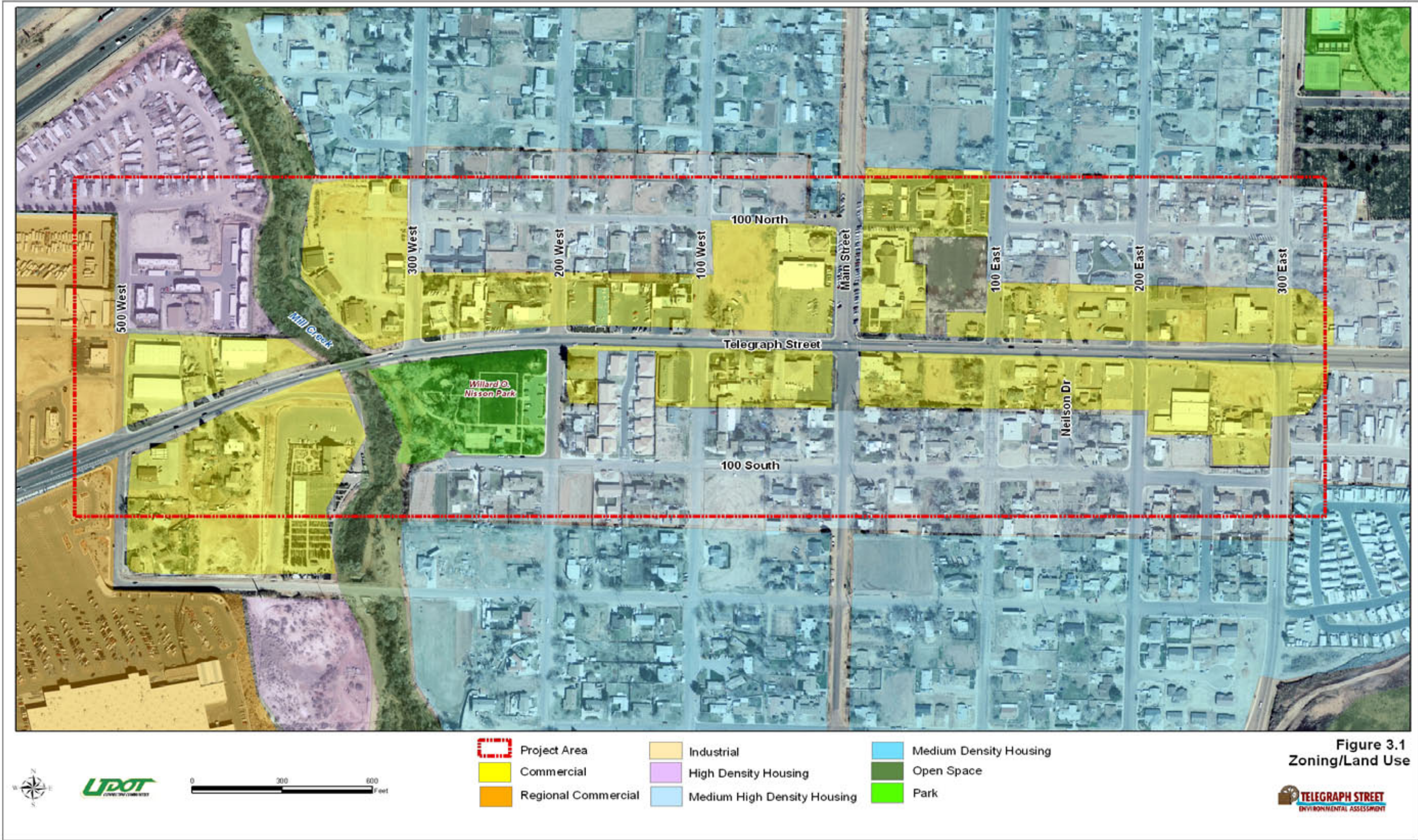
Telegraph Street is the main thoroughfare through Washington City and is used heavily by all types of traffic, including automobile, truck, motorcycle, and pedestrian. There is also occasional bicycle use on Telegraph Street, although there are no designated bicycle lanes. Telegraph Street is currently two lanes with a center turn lane in the project study area. It crosses Mill Creek at 300 West and continues east through the predominantly commercial downtown area that contains numerous historic buildings and features. 100 South is a two-lane road that begins just east of Mill Creek (approximately 300 West) and continues to a T-intersection with 300 East. 100 North is a two-lane road that extends from 300 West to Main Street (Civic Center and Veteran's Park, or Old City Park) and then from 100 East to its T-intersection with 300 East.

The Historic Downtown was the original center of town. Many early pioneer activities occurred in buildings in this area. Several of those buildings have been lost, but some

key historic structures have survived. These include the Cotton Mill, (currently being used as a landscape nursery), the old school (converted into a historical museum), and the historic Washington Relief Society Hall. These buildings have a pedestrian-oriented scale and they exhibit a high level of craftsmanship. Although the City Hall is not historic, its new construction maintains a traditional character. A unique feature in the Historic Downtown is Cottontown Village, a re-creation of a historic village that contains offices, retail, and meeting spaces.

A key amenity in the Historic Downtown area is Mill Creek. It provides a natural buffer between the Milepost 10 commercial area and the Historic Downtown. It is also a linear open space that links a variety of developments north and south of Telegraph Street to the downtown area.

With the extension of Main Street to the greater community north and south, the Telegraph/Main intersection is expected to become a true crossroads and an important downtown intersection. It will have the City Hall complex on one corner and a potential major infill project on the Nisson's Food Town grocery store site on the opposite corner (the General Plan).



3.1.3 Impacts

3.1.3.1 No Build Alternative

The No Build alternative would have no direct impacts to land use in Washington City. The General Plan's goal of creating a traditional, pedestrian-oriented "downtown" on Telegraph Street would still be viable and would likely continue forward even if Telegraph Street was not improved. Under the General Plan, the City would continue to encourage a variety of retail and other business uses and would support other measures not related to roadway improvements. However, the progress would be slowed because congestion would impede potential customers from reaching their destinations quickly and efficiently.

3.1.3.2 Build Alternatives

All of the Build alternatives would result in the conversion of some commercial and residential lands to use as highway right-of-way (ROW). **Table 3.1** lists the affected types of properties by alternative and the amount of ROW required for each alternative. The acquisition of ROW is a direct impact to land use. Consistent with the General Plan, none of the Build alternatives would preclude any future development in the downtown.

Table 3.1 Right-of-Way Acquisitions by Build Alternative

Use	Build Alternative				
	One	One – Narrow	Two	Two – Narrow	Three – Narrow (Preferred Alternative)
Residential (Acres)	0.37	0.33	0.6	0.4	0.53
Business (Acres)	1.19	1.02	1.21	1.01	1.13
Total Area (Acres)	1.56	1.35	1.81	1.41	1.66

Source: URS 2006

Other than temporary access issues during construction activities, the Build alternatives would not adversely impact Nisson Park or any of the other destination locations along Telegraph Street, including the historic Washington Relief Society Hall (see Section 3.16).

Positive direct impacts of the Build alternatives would include the creation of safer pedestrian facilities by:

- Improving pedestrian crossings at signalized intersections
- Removing some left turns from Telegraph Street at unsignalized intersections
- Improving or providing crossings at unsignalized intersections (e.g., pavement markings, crossing signals or flags, a refuge in the planted median, etc.)
- Installing a park strip between the sidewalk and the roadway

Increases in pedestrian traffic would also be one of the desirable outcomes that the Washington City General Plan identifies as necessary to encourage development of new retail uses in the Historic Downtown.

Indirect impacts of the Build alternatives could include acceleration of the rate of conversion of currently undeveloped land into commercial or retail properties, or conversion of residential properties into commercial or retail properties. The conversion could occur without construction of the roadway improvements on Telegraph Street. However, improvement of the road may accelerate the conversion by inducing businesses to relocate to a more accessible and attractive shopping environment.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to land use.

3.1.4 Mitigation Measures

The Telegraph Street improvement project is listed in the Statewide Transportation Improvement Program, the General Plan, and Washington City Transportation Master Plan (2005). The project is also consistent with, and will be designed to implement, the goals and policies of the General Plan for redevelopment of the Historic Downtown.

Under all Build alternatives there will be no prudent way to avoid acquiring project ROW from properties along Telegraph Street. These lands are needed so that the entire length of the roadway can be expanded to the specified design width. All Build alternatives were designed to minimize the amount of land to be acquired and thus minimize the conversion of land uses in the Historic Downtown.

3.2 Farmland

No farmland is located within the proposed project study area. Coordination with Natural Resources Conservation Service (NRCS) and State and local agencies was not done for this study concerning farmland. Farmland will not be discussed in this document.

3.3 Social Impacts

3.3.1 Community Character and Community Cohesion

3.3.1.1 Regulatory Setting, Studies, and Coordination

Zoning within the Project Study Area

Washington City's central commercial area is composed of two adjacent areas: the Historic Downtown and the more recent "big-box" center at the MP 10 interchange (the General Plan). Both of these adjacent centers share Telegraph Street as a common thoroughfare.

Telegraph Street, through Historic Downtown, is Washington City's only significant opportunity for a pedestrian-oriented downtown. The City's General Plan prescription for the downtown is to create a pedestrian-oriented core commercial center to generate pride and attract residents and tourists through its traditional buildings, shops, and restaurants. This is planned to be achieved by focusing stores on Telegraph Street, in Historic Downtown, as a pedestrian-oriented street with generous sidewalks, street trees, and a continuous facade of buildings that give enclosures, variety, and character to the downtown.

The area along Telegraph Street, within the project study area, is mostly zoned as commercial (the General Plan). The area along 100 South, within the proposed project study area, is zoned as medium- to high-density residential. In the General Plan, it is shown that Telegraph Street and many of the north-south streets that branch from Telegraph are zoned as commercial.

Residents in, and around, the Project Study Area

A survey conducted by Washington City reports that residents have lived in the city for an average of 8.8 years. This characteristic will change if the rate of growth remains high. One of the challenges for the city will be to continue to communicate the city's heritage and values to new residents, and communicate the importance of preserving the heritage of Washington City's older buildings. The citizens have also expressed a desire to create a downtown that will continue to be a focus for community activities and provide a strong identity for the city.

Also according to the survey conducted by Washington City, on average, 1.1 persons per household are working at least 20 hours per week. Thus, although there are retirees in Washington City, it is still a community with a strong base of working residents.

The U.S. 2000 Census indicated a 14-minute average commuting time to work for Washington City and St. George residents. In response to the opinion survey conducted as part of the General Plan, Washington City residents reported higher travel times for work, on a per-household basis.

With no transit options and most work being located outside of Washington City, most of the residents commute to work in their cars. As the city grows and there are more travelers on the road, congestion will become worse.

3.3.1.2 Affected Environment

Of the developed areas within Washington City, some are residential, others are a mix of residential and commercial, and still others are just commercial, and have been developed to be “big-box” shopping areas. The areas surrounding the project study area are the MP 10 Regional Commercial area, “Old Town” South neighborhood, the Mill Creek Business area, and “Old Town” North neighborhood (the General Plan). These areas are shown on **Figure 3.2**.

The Historic Downtown is centered at the intersection of Telegraph and Main streets. Many early pioneer activities were housed in buildings in this area. Several of those buildings have been lost throughout the years, but the history of the area remains strong, and some key historic structures still survive: the Washington School (converted into a historic museum), the old stone jail (now a visitor’s center), the Relief Society building (now a meeting hall), and several older homes. Further west, the Cotton Mill has been restored and is currently being used as a landscape nursery. Subsequent additions that have infilled and extended the downtown east and west include Nisson’s Market (now hardware/variety store), Nisson’s grocery store (now Nisson’s Food Town), the Post Office, and numerous small businesses, restaurants, and residences.

Residents can easily reach businesses along Telegraph Street within the proposed project area by walking or driving. They also have easy access to both Nisson Park and Veteran’s Park. Veteran’s Park is a major focal point of the community, serving as youth soccer fields as well as a civic gathering space. Telegraph Street itself is also a focal point because of its historic nature and because of the businesses located there. It occasionally closes for parades on holidays, and there are many historic places of interest to both residents and visitors.

Cottontown Village is located at Mill Creek and Telegraph Street. It is a re-creation of a pioneer-era community that includes shops, offices, and a meeting hall. Other key areas of the Historic Downtown include Nisson Park, with its signature water wheel monument, City Hall, Veteran’s Park, and a Church of Jesus Christ of Latter Day Saints

(LDS) chapel. The sculpture plaza in front of the historic Washington School features statues of pioneers that settled Washington City.

Washington Elementary School is located north of Telegraph Street, at 300 North and 300 East. According to the 2000 Census, there are approximately 228 school-age children located south of Telegraph Street. According to Washington County School District surveys (Washington County School District 2006), approximately 60 percent of these children (137) are of Elementary School age. Since most of this area is within 1.5 miles of the school, those children will either walk or be driven by parents to school and will cross Telegraph Street to do so.

There has been virtually no new construction in the study area in the last 5 years. This could indicate a low appeal for this area for commercial use and a modestly declining appeal for residential use. One residence on Telegraph Street was recently converted to an insurance office. As with many other downtowns undergoing renewal and redevelopment, it may indicate a trend toward conversion of residences to commercial uses that seek to retain the architectural character of older buildings.

3.3.1.3 Impacts

No Build Alternative

If the No Build alternative were chosen, the construction of a widened road would not take place, traffic would increase, and – absent downtown redevelopment – the upgraded pedestrian facilities would not take place. The general community character and cohesion would likely remain unchanged or deteriorate, with increased traffic making street-crossing more difficult and making closing the street for the holidays less viable within the proposed project area. Indirect impacts could include a reduction in community cohesion and character, because the Historic Downtown area may not be revitalized and developed if the area remains as it currently exists.

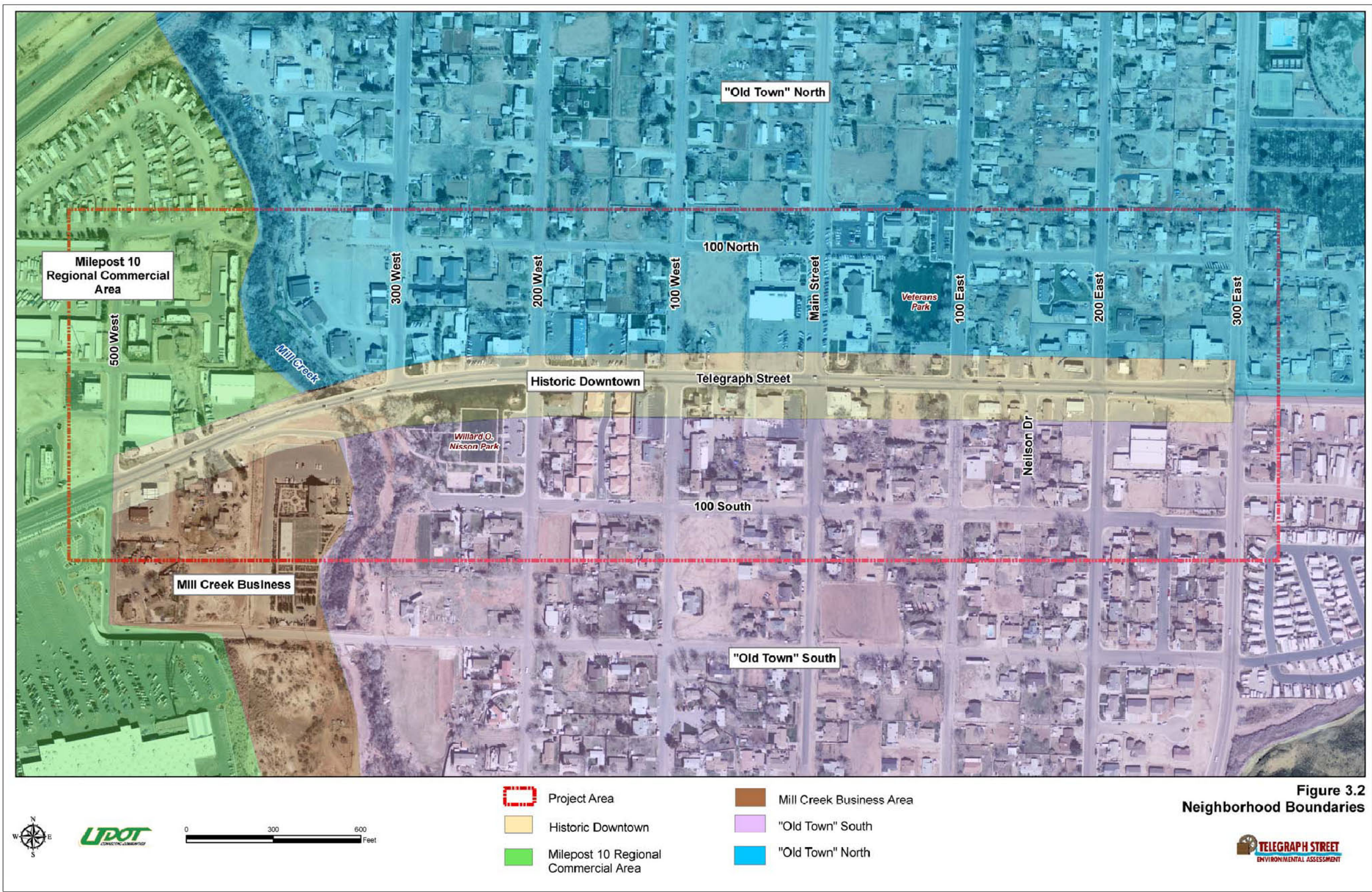
Build Alternatives

The General Plan calls for a pedestrian-oriented downtown. Construction of any of the Build alternatives would directly impact the community with temporary road closures and possible detours. These actions would cause minor traffic congestion and possibly make it unsafe for community members to walk in the areas that are under construction. After construction, unless there are adequate pedestrian accommodations, four lanes of traffic may act as a divisive feature in the downtown rather than a unifying “main street.” The approximately 137 elementary school-aged children who cross Telegraph Street – either walking or driven by parents – would be directly affected by the safety of the intersections and pedestrian accommodations. All of the Build alternatives incorporate pedestrian facilities in their design in order to provide safe crossing areas.

Some of the permanent indirect impacts could be a rebirth of business along Telegraph Street between 500 West and 300 East because of better traffic flow and sidewalks designed for a pedestrian-oriented Historic Downtown. The sidewalks and new park

strips would create an atmosphere that is conducive to having more community events along Telegraph Street and at the parks. Many of the roads surrounding Telegraph Street are residential, and people would be more likely to walk to the shops if they felt the sidewalks were safer and designed to bring the community together.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant social impacts.



3.3.1.4 Mitigation Measures

UDOT believes in creating Context Sensitive Solutions for road designs and for communities. According to the General Plan, the City would like to create a pedestrian-oriented downtown that could bring new business and community cohesion to Washington City. The road designs will be developed to meet these objectives by widening the road and creating safer pedestrian facilities along Telegraph Street.

Other potential mitigation measures include:

- Improve pedestrian circulation and preserve aesthetics within the neighborhood
- Enhance the cohesiveness of surrounding routes in the community

3.3.2 Relocations

3.3.2.1 Regulatory Setting, Studies, and Coordination

Relocation policy is provided in the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 as amended in 1987 (Relocation Act 1970). The State of Utah has a relocation policy provided in the Utah Code and Constitution/Title 57 – Real Estate/Title 57 Chapter 12 – Utah Relocation Assistance Act (Title 57). UDOT's Relocation Assistance Program (RAP) is based on both statutes.

In Utah, UDOT is the lead agency responsible for implementing the Federal Relocation Program and the State of Utah Relocation Program. If a project requires an individual, family, or business to move as a result of a Federal or Federally assisted program or a State-assisted program, a relocation agent will work directly with the affected party.

3.3.2.2 Affected Environment

A variety of retail, service, and other businesses are located along Telegraph Street within the project area (refer to **Table 3.6** for a list of businesses). Other retail uses occupy strip malls between 200 West and 100 West along Telegraph Street. A large market (Nissan Food Town) is located on Main Street just north of Telegraph Street. The parking lot for this store extends all the way to Telegraph Street. Two gas station/convenience stores are located at the west and east ends of Telegraph Street. Other businesses on Telegraph Street include a laundry, realty office, fast food restaurant, salons, and insurance offices. Some of the retail space is tenant-owned, but most of it is rented.

Both of the gas stations have convenience stores that are setback approximately 100 feet or more from Telegraph Street, while the gas pumps are only 35 feet from the road. Both of the stations can be accessed from Telegraph Street and side streets. The nursery located at 385 West is setback over 200 feet from Telegraph Street and has a large

parking area between the building and nursery area and Telegraph Street. It can only be accessed from Telegraph Street.

Many of the businesses between 300 West and 300 East are setback approximately 50 feet from Telegraph Street with parking along the fronts and sides of the buildings. Most of the businesses can be accessed from Telegraph Street and from a side street. There are two strip malls, one on the north side and one on the south side of Telegraph Street, that can only be accessed from the side roads. They run north-south along the side street, instead of east-west along Telegraph Street.

Nisson Store (10 East Telegraph Street) is only setback approximately 10 feet from Telegraph Street. It sits immediately adjacent to the sidewalk. Many of the other businesses between Main Street and 300 East are only setback between 20 and 30 feet from Telegraph Street. Most of these businesses have parking that is accessed from a side street.

The current market value of commercial space within the study area ranges from \$90.00 per square foot (sf) to \$120.00/sf. The value of new commercial space within 1 to 2 miles of the study area ranges from \$150.00/sf to \$275.00/sf.

The Post Office and Washington City Museum (Museum) are located on Telegraph Street at its intersection with Main Street. The Post Office is located on the southwest corner of this intersection and has a parking lot on the east side of the building that is accessed from Main Street. The Post Office has a setback of approximately 30 feet from Telegraph Street, and there is a grassy area between the sidewalk and the building. The Museum is on the northeast corner of the intersection and is accessed from Main Street. There are several buildings associated with the Museum property, and they all sit at least 85 feet north of Telegraph Street. A statue garden is located on the southeast corner of the Museum property that can be accessed from the Museum parking on Main Street or by walking along the sidewalk adjacent to Telegraph Street. The statue garden sits approximately 25 feet north of Telegraph Street.

Two parks front on Telegraph Street: Nisson Park and Veteran's Park. A large portion of Nisson Park fronts Telegraph Street. This area is grassy and has a sidewalk. All of the park amenities are located in the southern portion of the park. Nisson Park can only be accessed from 200 West or 100 South. Veteran's Park has only a small portion that fronts Telegraph Street. The portion that fronts Telegraph Street is in between the Museum and the historic property at 95 East (**Figure 2.1**). Much of the park is north of the property located at 95 East Telegraph Street, and it is a large playing field. Veteran's Park can be accessed from Telegraph Street or 100 East. There is also an historic jail located at Veteran's Park just north of Telegraph Street.

The residential uses in the project study area include townhomes, condominiums, and standard single-family homes of varying sizes. The current market value of single-family homes within the project area ranges from \$120,000 to \$300,000. Many of the homes

fronting Telegraph Street still have large front yards with landscaping. Some of the homes are considered historical and are discussed further in Section 3.17.

Many of the homes that front Telegraph Street are accessed from side streets instead of from Telegraph Street. There is a townhome community located at 151 West Telegraph Street that can be accessed from Telegraph Street or 100 South. Most of the single-family homes are setback at least 25 feet from Telegraph Street and have lawns and landscaping in the front yards including mature trees. The homes located between 500 West and the bridge are setback over 70 feet from Telegraph Street.

Based on aerial photography from early 2006, there are only four parcels along Telegraph Street in the project study area that have not been developed. These parcels range in size from 0.10 acres to 0.70 acres. There are also three partially developed parcels, which still have about 0.30 acres of undeveloped land.

3.3.2.3 Impacts

No Build Alternative

There would not be any direct impacts from potential relocations under the No Build alternative. Because the No Build alternative does not require new ROW, no acquisition would be required; therefore, the need for relocation would not arise. Indirect impacts could include some of the population moving from the area because business opportunities or development might not happen without an improved road and pedestrian-oriented downtown area.

Build Alternatives

Direct impacts would include potential relocations or partial acquisitions in the proposed project area for all of the Build alternatives. **Table 3.2** lists the proposed full or partial acquisitions for both residential and business properties for each Build alternative.

Table 3.2 Number of Parcels Impacted by Build Alternative

Alternative	Partial Acquisitions (#of Parcels)			Full Acquisitions (# of Parcels)		
	Residential	Business	Total	Residential	Business	Total
One	14	23	37	4	7	11
One – Narrow	12	25	37	1	3	4
Two	16	25	41	2	5	7
Two – Narrow	8	22	30	2	2	4
Three – Narrow (Preferred Alternative)	17	28	45	1	2	3

Source: URS 2006

During construction of any of the Build Alternatives there would be short-term direct impacts to residences and businesses, including some temporary relocations of business access. However, at this time, it is not anticipated that any business would be denied

access during the construction. It is not known at this time where the temporary closures would happen. Direct impacts to businesses from potential relocations and partial acquisitions are discussed in Section 3.4.3.

Please refer to the figures in Chapter 2 to see the locations of businesses and residential properties that would be potentially relocated by alternative.

The following is a discussion of the impacts to residential buildings by alternative.

Alternative One

Residences

Four residential homes would be relocated for this alternative (Refer to **Figure 2.1**). The homes are located at:

- 10 North 100 West
- 82 East Telegraph Street
- 124 East Telegraph Street
- 24 South Neilson Drive

This is a long-term permanent impact. There are several residential developments within Washington City that have homes available. The families living in these homes should be able to relocate in Washington City if they want to. They would likely be located further from Telegraph Street shopping areas and convenience stores, since they are currently located just southwest of the First Stop (convenience store and gas station) on Telegraph Street.

An indirect impact could include members of these households spending more money and time driving to retail businesses that have been relocated away from Telegraph Street. The potential relocation of residents would likely move them further from the two parks along Telegraph Street. However, there may be new parks located within the area they move to as the General Plan does discuss several planned parks within Washington City (Section 3.22.4).

An indirect impact of relocating these homes could be new development on the remaining lots. UDOT would require a large portion of these parcels for the construction of the wider road. However, there would still be land remaining that could be developed for commercial uses. This could, in turn, increase the number of retail or commercial businesses along Telegraph Street.

Businesses

Alternative One would have direct permanent impact on seven businesses along Telegraph Street (that is 22 percent of the total businesses in the project study area on Telegraph Street). One of the businesses occupies an historic building and will be discussed further in Section 3.17. The business located in an historic building is the

Good Ol' Boys Tire and Service Center. The other six businesses that would be permanently impacted by this alternative include:

- Old Town and Country Gas Station and Convenience Store
- Nisson Store
- Teton Loans
- The Burger Place
- Sun Country Awnings
- Liberty Realty

Alternative One directly impacts the most businesses and would have the largest indirect economic impact on the businesses along Telegraph Street and within the city.

If these businesses did not relocate within Washington City, tax revenue to the City would be lost. There would still be one gas station/convenience store (First Stop) within the project study area, and many of the people who used Old Town and Country could use the First Stop or travel a short distance to the MP 10 regional commercial area, which has many gas station/convenience stores.

The Burger Place is the only fast food location within the project study area. Patrons of this business would need to go to the MP 10 area to find other, similar businesses. The Sun Country Awnings store is a unique store in the area. If it does not relocate within Washington City, people may be required to travel to St. George to find a similar business.

Alternative One – Narrow

Residences

There would be one residential home directly impacted by this Build alternative (10 North 100 West). The direct impacts to this residence would be the same as those in Alternative One.

Businesses

This alternative would also directly impact the Nisson Store, the Burger Place, and the Good Ol' Boys Tire and Service Center, which is located in an historic building.

This alternative would only directly impact 9 percent of the businesses located within the project study area, and it would likely have less of an indirect impact on services available within the project study area.

All of the businesses directly impacted would likely be able to relocate within the city. If a business chose not to relocate at all or not within the city, there are similar services available at the MP 10 Regional Commercial Area. If the businesses did not relocate within Washington City, there would be a small indirect impact on the tax revenue received from those businesses within the city.

Alternative Two

Residences

Two residential homes would be directly impacted by this Build alternative. The homes are located at 10 North 100 West and 95 East Telegraph Street. Refer to the direct and indirect impacts discussed in Alternative One.

Businesses

Alternative Two would directly impact 15.6 percent of the businesses along Telegraph Street in the project study area. This alternative would directly impact the Burger Place, First Stop Food Mart, Mike's Barber and Beauty Shop, Good Ol' Boys Tire and Service Center, and Old Town and Country Gas Station.

This alternative would remove and/or relocate both of the gas stations located within the project study area, making it less convenient to get fuel for those who have been using these gas stations because they were close to their residences. The removal of these gas stations would indirectly impact other gas stations in the area by likely increasing the business at other gas stations located just outside of the project study area near the MP 10 development.

Alternative Two – Narrow

Residences

Two homes would be directly impacted by this Build alternative. The residences are located at 10 North 100 West and 95 East Telegraph Street. Refer to the direct and indirect impacts discussed in Alternative One.

Businesses

Two businesses would be directly impacted by this alternative: the Burger Place and The First Stop. This alternative directly impacts 9 percent of the businesses within the project study area. The services that are provided by these businesses are readily available within a short distance from their current location in the MP 10 development.

If the businesses chose to relocate, it is likely that there would be available commercial space within Washington City.

Alternative Three – Narrow (Preferred Alternative)

Residential

The home at 10 North 100 West would be directly impacted by this Build alternative. Refer to the direct and indirect impacts discussed in Alternative One.

Businesses

Two businesses, the Burger Place and Nissan Store, would be directly impacted by this alternative. The two businesses represent 9 percent of the businesses within the project study area. Please refer to the discussions above in Alternatives One – Narrow and Two – Narrow for an overview of the direct and indirect impacts to these businesses.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts resulting from relocation of residences or businesses.

3.3.2.4 Mitigation Measures

The acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and relocation resources will be available to all relocates without discrimination.

3.3.3 Public Facilities, Services, and Utilities

3.3.3.1 Regulatory Setting, Studies, and Coordination

Federal laws and Federal Highway Administration (FHWA) regulations contained in Title 23 of the United States Code (U.S.C.) and in the Code of Federal Regulations, respectively, have been developed to govern when and how utilities may use public highway ROW, and under what conditions public funds may be used to relocate utility facilities to accommodate highway construction. 23 U.S.C. 109(1) addresses the accommodation of utilities on the ROW of Federal-aid highways, and 23 U.S.C. 123 addresses reimbursement for the relocation of utility facilities necessitated by the construction of a project on any Federal-aid highway.

3.3.3.2 Affected Environment

The proposed project area contains several public utilities. These utilities include overhead power lines, storm drains, sewer systems, telephone lines, cable lines, water systems, and fire hydrants.

Several schools could be affected by the Proposed Action. Although no public or private schools are located along 100 South or Telegraph Street, the following schools could be affected by the construction of the proposed project:

- Horizon Elementary School
- Millcreek High School
- Riverside Elementary School
- Washington Elementary School

The Washington City administrative building is located just north of Telegraph Street on 111 North and 100 East. The Washington Museum and sculpture court is located at the

corner of Telegraph Street and Main Street. The Washington City Fire Department, Police Department, and city medical facilities are not located within the proposed project area, but could be affected by construction activities and operations of widening the road. A Post Office located at the intersection of Telegraph and Main Streets within the project study area could be affected. An LDS ward chapel is located just north of Telegraph Street on Main Street.

3.3.3.3 Impacts

No Build Alternative

There would not be any direct impacts to public facilities, services, or utilities under the No Build alternative. There could be indirect impacts to the utilities or facilities during regular road maintenance. Currently, there are a number of unsignalized intersections through which children may pass to get to Washington Elementary School (on foot or driven by parents). These intersections have left turns from Telegraph Street across heavy traffic. The No Build alternative would leave these intersections in a less-safe condition as traffic increases.

Travel times would likely increase along Telegraph Street as congestion increases. The increased travel times would also impact emergency response vehicles.

Build Alternatives

All of the Build alternatives would have the same direct and indirect impacts on public services and utilities. As such, the alternatives will not be discussed independently. The facilities, utilities, and services that would be interrupted are described in following several paragraphs.

During construction of any of the Build alternatives, the vertical grade of the existing road would not be drastically changed. Some of the utility companies may want to improve their existing utilities based on the widened road alignment, which could create temporary direct impacts to the utilities located under Telegraph Street. This could cause temporary outages during the construction phase.

The overhead power lines would need to be moved during construction. Depending on the alternative, the wider road would be too close to the power poles, or the wider road would be constructed out further than the existing power poles. The movement of the power poles could cause temporary outages during construction, but it should not cause any long-term negative direct impacts to the community. The replacement of power poles could be positive direct impact for the community and for the utility companies. It could give the companies the opportunity to increase the capability or quality of the lines currently running on the poles. This could increase the companies' abilities to serve Washington City in the long term.

As stated above, there is a Post Office located on Telegraph Street within the project study area. The Post Office would be directly impacted by construction, maintenance,

and operation of the wider road. The access would be temporarily changed during construction or maintenance but would not be permanently impacted in the long term. Direct impacts would also include small ROW strip takes required for all of the Build alternatives. Refer to **Table 3.3**, below, for a listing of the ROW required from the Post Office by alternative.

Table 3.3 Right-of-Way Required from the Post Office by Build Alternative

Alternative	ROW (Acres)
One	0.06
One – Narrow	0.04
Two	0.01
Two – Narrow	0.00
Three – Narrow (Preferred Alternative)	0.04

As can be seen in the table above, the Post Office would be directly impacted by ROW strip takes under any of the Build alternatives. Long-term indirect impacts to the Post Office may be an increase in business resulting from improved access on Telegraph Street and possible future expansion or relocation.

The Washington Museum vehicle entrance is located on Main Street. There is a pedestrian entrance along Telegraph Street via a sidewalk leading to the main building. None of the Build alternatives would require acquisition of any of the buildings located at the Museum. Direct impacts under all of the build alternatives would include minor ROW acquisition from the southern portion of the property. Although the ROW acquisition may require relocation of the sidewalk closer to the Museum building, it is not anticipated to affect use of or access to the facility.

The other public facilities listed in the Affected Environment section (3.3.3.2) – such as government buildings, schools, and medical facilities – would experience short-term direct impacts from road construction including restricted access to facilities during construction due to road closures, road closures, detours, or congestion.

There are approximately 137 elementary school-aged children living south of Telegraph Street who are not within busing distance from Washington Elementary (north of Telegraph Street). The quality and safety of pedestrian walkways, crossings, and intersections could indirectly affect schools. If students do not feel safe crossing Telegraph Street after it is widening there may be more students who are driven to school, thus increasing the number of cars using the student drop off areas.

A long-term positive indirect impact could include generally reduced travel times to all of these public facilities because of better traffic flow within the project study area, which could create better traffic flows throughout the community. The increased traffic flows could also create a negative impact if the traffic were to increase so much that congestion started to develop.

The proposed action could also temporarily increase the response time of the police and fire department and decrease their efficiency in responding to incidents during the construction of any of the Build alternatives. When the proposed action is completed and the road is wider and traffic flows are better, the response time of both the fire department and the police department would likely decrease.

This proposed action could result in an indirect impact because of a need for additional public facilities, as it is increasing the overall traffic in the area. This traffic could increase business use in the area and create a need for upgraded or additional infrastructure. The general population of Washington City would not likely increase from this project, but it might create more use in the general area of the proposed project.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to public services, facilities or utilities.

3.3.3.4 Mitigation Measures

During construction and maintenance of the facility, UDOT will coordinate with public entities to minimize disruptions, delays, and negative effects on emergency response time. Coordination will involve school districts, police and fire departments, water and sewer districts, telephone and cable companies, and other public service providers that may be affected by the action.

Public notification of temporary road closures or service disruptions through signing and direct mail will also be implemented.

Improved pedestrian accommodations will include:

- Tree planting strips to separate sidewalks from the roadway for added safety and comfort of pedestrians
- Medians to separate traffic and eliminate left turns at several unsignalized intersections, improving safety for pedestrian crossings
- Crossing improvements at unsignalized intersections, including pavement markings, traffic control (demand signals, flags, etc.), and a median that could provide pedestrian refuge

3.3.4 Recreation Resources

3.3.4.1 Regulatory Setting, Studies, and Coordination

Parks and recreation facilities are important to the livability of Washington City. Parks are generally a place for the community to gather and hold special community events. The Section 4(f) recreational properties within the proposed project area are Nisson Park, Veteran's Park, and the Mill Creek Trail; all are discussed in Section 3.3.4.2. No specific

regulations apply to recreation resources, except the 4(f) considerations that are covered in detail in Chapter Four: 4(f) Evaluation.

No specific studies have been conducted on the recreation resources within the project study area.

UDOT would coordinate with Washington City on any construction or other operation that would impact any recreation resource.

3.3.4.2 Affected Environment

In the Historic Downtown, there are two parks: Willard O. Nisson Park and Veteran's Park (often called Old City Park). These parks provide both open-turf areas for informal play and relief from development. They also bring shade and color to the appearance of the city. According to the General Plan, "these parks are felt to be contributors to positive 'first impressions' of Washington City and therefore important economic development tools to help attract both businesses and workers to Washington City." In addition to these two parks is the Mill Creek Trail that follows Mill Creek under Telegraph Street. Washington City's Parks and Recreation Department oversees the park and trail systems.

Nisson Park, opened in May of 1999, has a covered pavilion, playground area, basketball hoops, shaded walking path with picnic tables, restrooms, and large playing field. Nisson Park is located on Telegraph Street between Mill Creek and 200 West and between Telegraph Street and 100 South. The park is approximately 4 acres.

Veteran's Park is located at 50 East Telegraph Street and is approximately 4 acres. Located in Historic Downtown Washington City, the park has large shade trees, a covered pavilion, playground area, restrooms, and large playing field. Many of the City-sponsored sports are played at this park.

There is a nature trail along Mill Creek. The Mill Creek Trail passes under Telegraph Street and is an important link that unites the north and south halves of the city. It provides important access to parks and open spaces, including the Habitat Conservation Area to the north and the Virgin River Trail corridor to the south.

The parks and the Mill Creek Trail may be considered 4(f) resources and are discussed in Chapter 4 of this document in more detail.

3.3.4.3 Impacts

No Build Alternative

Under the No Build alternative, there could be no direct impacts to recreation facilities along Telegraph Street. There could be indirect impacts to recreation facilities caused by

noise and polluted from an increase in traffic congestion. Refer to Sections 3.6.3 and 3.7.3 for a discussion of noise and air direct and indirect impacts.

Build Alternatives

A direct impact from the increased traffic capacity could to bring more people into Historic Downtown to use the trail and the parks because of the more convenient access. A temporary indirect impact created by all of the Build alternatives, however, could be decreased use of the parks and the trail during construction of the wider road. During construction, access might be restricted, or construction activities could be too loud to enjoy the areas.

One of the screening criteria that was used to select the Preferred Alternative (Alternative Three – Narrow) was how much land would be directly (permanently) removed from Nisson Park. **Table 3.4** shows the acres required for ROW at Nisson Park by each alternative.

Table 3.4 Impacts to Willard O. Nisson Park by Build Alternative

Alternative	Impacts to Nisson Park (Acres)
One	0.02
One – Narrow	0.00
Two	0.11
Two – Narrow	0.07
Three – Narrow (Preferred Alternative)	0.15

Source: URS 2006

Direct impacts to Veteran's Park vary; however, the park would not be directly impacted to a large extent by any Build alternative. The portion of Veteran's Park to be directly affected fronts Telegraph Street and is located at 50 East Telegraph Street, in between the Museum and a historic building located at 95 East Telegraph. The amount of minor ROW acquisition required by Build alternative is summarized in **Table 3.5**. These minor ROW acquisitions are required so that the sidewalks can be moved towards the park as Telegraph Street is widened. None of the ROW required would directly impact any of the use areas of the park. Park strips would also be built and would likely be landscaped. This landscaping would provide direct visual and noise break between the traffic and the park.

Table 3.5 Minor ROW Acquisition Required from Veteran’s Park by Build Alternative

Alternative	ROW (Acres)
One	0.009
One – Narrow	0.004
Two	0.029
Two – Narrow	0.024
Three – Narrow (Preferred Alternative)	0.007

The trail along Mill Creek would not be directly impacted in a permanent way and would remain as it is now under all of the Build alternatives. It would be temporarily directly impacted by construction activities, especially during the bridge reconstruction. All of the Build alternatives would replace the existing bridge on Telegraph Street over Mill Creek. This would temporarily restrict access to Mill Creek and the trail.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to recreational facilities or resources.

3.3.4.4 Mitigation Measures

For all of the Build alternatives, the public will be adequately notified of any impacts to recreational facilities. Measures will be taken to minimize the noise or temporary access closures due to construction activities. The public will be notified of any temporary closures of park accesses due to construction activities.

3.3.5 Environmental Justice

3.3.5.1 Regulatory Setting, Studies, and Coordination

All projects involving Federal action (funding, permit, or land use) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This EO directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services’ poverty guidelines. Minority populations are defined as populations that have little representation in the community based on the demographics of the particular community.

The Federal-aid Highway Act of 1970: 23 U.S.C. 109(h) establishes guidelines for compliance with the Environmental Justice (EJ) component of the National Environmental Policy Act (NEPA). The effort to prevent discrimination must address, but not be limited to, a program’s impacts, access, benefits, participation, treatment, services, contract opportunities, training opportunities, investigations of complaints, allocations of funds, ROW, research, planning, and design.

Other guidance from FHWA includes FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 6640.23), DOT Order on Environmental Justice to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2), and Implementing Title VI Requirements in Metropolitan and Statewide Planning.

A study of the demographics within the project study area was conducted to assess if any EJ population was within the project study area that would be disproportionately impacted by the proposed action.

3.3.5.2 Affected Environment

According to the 2000 Census, the percentage of the population that is minority in the project study area (for this section, the study area also included 100 North and 100 South from 500 West to 300 East because that is how the census areas were identified) is 2 percent higher than the city overall (8 percent versus 6 percent). In 2000, there were a total of 20 non-white residents in the study area. The project study area has a slightly lower median income than the city as a whole (\$32,782 versus \$35,341).

3.3.5.3 Impacts

No Build Alternative

There would not be any direct or indirect impacts to EJ populations with the No Build alternative.

Build Alternatives

Given the low number of residences actually on Telegraph Street, relative to 100 North and 100 South, it is doubtful that there is a minority population in the project study area that would be affected by the construction on Telegraph Street. Therefore, it is unlikely that this population would be disproportionately directly or indirectly impacted by the proposed action.

Also, given the low number of residences actually on Telegraph Street, relative to 100 North and 100 South, it is unlikely that the lower-income population in the project study area would be disproportionately directly or indirectly impacted by the proposed action. Therefore, because there are no populations within the project study area that would be disproportionately affected by any of the proposed Build alternatives, there will be no significant impacts related to environmental justice.

3.3.5.4 Mitigation Measures

Because no EJ population will be disproportionately impacted by any of the Build alternatives, no mitigation measures have been identified at this time.

3.4 Economics

3.4.1 Regulatory Setting, Studies, and Coordination

23 U.S.C. 109(h) mandates consideration of social and economic impacts to the human environment. Council on Environmental Quality (CEQ) regulation 40 C.F.R. 1508.14 requires that an Environmental Assessment (EA) must discuss economic and social effects of a proposed action if these effects are directly related to effects on the natural and physical environment.

The General Plan was analyzed for any information regarding economic studies within the project study area and the city.

No specific coordination was conducted with the City or County for economic information within the project study area. Information was gathered from online sources within the economic departments for Washington City and County.

3.4.2 Affected Environment

Most cities do not have specific data related to economics for just a small portion of the city. For this reason, a private company was sent to collect information on the businesses and their addresses along Telegraph Street. Other discussions on the affected environment are described at the State, County, and City levels. Specific data along Telegraph Street was used in the description of the affected environment when available.

3.4.2.1 Business Setting

The businesses along Telegraph Street include restaurants, grocery stores, hardware stores, variety stores, and other small businesses. Refer to **Table 3.6** for a list of businesses and their addresses. The ID Number in the table corresponds to the locations of the listed businesses as shown in **Figure 3.3**.

Table 3.6 Businesses Located Along Telegraph Street in the Project Study Area

ID #	Address	Business Name
1	498 West Telegraph Street	Minnies Storage
2	471 West Telegraph Street	Old Town and Country Gas Station
3	385 West Telegraph Street	Star Nursery
4	258 West Telegraph Street	Grants Plumbing and Heating

ID #	Address	Business Name
5	214 West Telegraph Street	Good Ol' Boys
6	195 West Telegraph Street	Allstate
7	174 West Telegraph Street	Teton Loans
8	174 West Telegraph Street	Pro 1 Nails
9	174 West Telegraph Street	Cooper Tires
10	174 West Telegraph Street	Monica's Pamper Paws
11	140 West Telegraph Street	Washington Auto Sales Inc.
12	117 West Telegraph Street (Suite A)	Hot Nails & Cool Cuts
13	117 West Telegraph Street (A1)	Turnbow Sign & Arts
14	117 West Telegraph Street (Suite C)	Red Desert Motor Sports
15	115 West Telegraph Street	Burger Place
16	25 West Telegraph Street	Post Office
17	10 East Telegraph Street	Nissan Store
18	11 East Telegraph Street	Washington History Museum
19	111 East Telegraph Street	Mike's Barber and Beauty Shop
20	127 East Telegraph Street	Allied Pacific
21	160 East Telegraph Street	Sun County Awnings
22	195 East Telegraph Street	First Stop Food Mart Inc Gas Station
23	196 East Telegraph Street	Liberty Realty
24	214 East Telegraph Street	Country Comforts Furniture
25	217 East Telegraph Street	Head Start
26	293 East Telegraph Street	Huntsman Finance
27	293 East Telegraph Street	DMK Distributing Inc.
28	293 East Telegraph Street	A&S Construction
29	293 East Telegraph Street	PBR Marketing
30	293 East Telegraph Street	Sunrise Laundry
31	293 East Telegraph Street	Intac Inc.
32	45 North Main Street	Nissan Food Town

Source: Rosenberg Associates November 2006

Just west of the Historic Downtown area is another area that has been and is still being developed for “big box” stores and other retail businesses. The “big box” stores in the area include Wal-Mart and Home Depot, and there are also several chain restaurants.



3.4.2.2 Employment

In 2004, the Civilian Labor Force in Washington County was 50,392. Of this total, 48,167 were employed, making the unemployment rate 4.4 percent (2006 Economic Report to the Governor). The unemployment rate in Utah during 2004 was 6.2 percent. Washington County was below the state average, indicating a stronger employment capability in Washington County. This continued in 2006, when Washington County's unemployment rate at the end of June was 2.7 percent and Utah's average was 3.1 percent (U.S. Department of Labor, 2006).

According to the General Plan, 31 percent of the households in have at least one person working in Washington City. Many of the residents who live in Washington City commute outside of the city to work.

3.4.2.3 Income

The average *Family* and *Household* incomes for Washington City, St. George, and Washington County were reported in the 2000 Census. *Family* income differs from *Household* income in terms of who contributes to the total income figure. *Family* income is based only on the incomes of the biologically/legally related members of a family living in the same residence who are 15 years old and older. *Household* income is based on the incomes of *all* occupants of a residence 15 years and older, including both family and non-family household members. The incomes of people who live alone would be reported as *Household* income, but not *Family* income.

There are subtle differences in the *Family* and *Household* incomes in the area. In 2000, Washington City's Median *Household* Income was \$1,200 less than St. George and \$1,900 less than the County. With regard to *Family* Median Income, St. George and the County are almost equal, but Washington City's median income approximately \$3,000 less.

Washington City's lower *Household* and *Family* incomes may in part be a reflection of the lack of housing available in the past to attract higher-income-level residents. Recent and pending upscale developments in Washington City may be raising the median income levels somewhat in the future.

The City and County median incomes are significantly lower than those of the Wasatch Front, as represented by the North Salt Lake Comparison from 2004 Census (\$52,485). This difference could be a reflection of several factors, including the relatively large retirement segment of the population that is living on pensions and the lack of skilled employment opportunities in the Washington County area. As the region continues to grow and regional business access improves with the new airport, it is likely that the area will be increasingly attractive to employers who require higher skilled employees, and incomes will begin to rise (the General Plan).

3.4.3 Impacts

3.4.3.1 No Build Alternative

Under the No Build alternative, there could be direct impacts to existing economic conditions or businesses along the corridor. Direct impacts to economic conditions may include reduced or delayed development or redevelopment of retail or other business uses in the downtown area. An indirect impact could be a decline in visits by shoppers to the downtown area because of increasing traffic congestion.

3.4.3.2 Build Alternatives

The following sections summarize direct and indirect impacts to businesses that would result from any of the Build alternatives. For a detailed list of business acquisitions required for each alternative, refer to Section 3.3.2.

Under any of the Build alternatives, road widening would increase traffic along Telegraph Street. This may indirectly benefit current and future businesses by providing a larger customer base to support local businesses and non-local businesses, such as Starbuck's. A wider road could draw more automobile and pedestrian shoppers to the area. In turn, business growth in the downtown area would likely increase the demand for employees and create job opportunities along Telegraph Street, this would be an indirect impact. Retail space is currently available in Washington City, and businesses seeking to relocate may be able to find available land or commercial space along Telegraph Street.

All of the Build alternatives would require potential relocation of the Burger Place, this would be a direct impact. Although it would permanently close at its current location, the closure would be temporary if the Burger Place decided to reopen at a new location. Alternate sites are available within Washington City to relocate the Burger Place. A decision by the Burger Place not to reopen would permanently directly impact its existing customers and represent a loss of tax revenue to Washington City. The loss of revenue from this business, as well as others that choose not to reopen, would not be significant over the long term, as most of Washington City's tax revenue is derived from the "big box" stores and restaurants located at the MP 10 shopping area.

All of the Build alternatives would add medians to Telegraph Street. The addition of medians would change business accesses from either direction, this would be a direct impact. A slight shift in the patterns of future development may result, as development may be planned around existing breaks in the median instead of occurring at any location along the corridor.

Alternative One

Alternative One would permanently directly impact seven businesses along Telegraph Street (22 percent of the businesses on Telegraph Street). One of the businesses, the

Good Ol' Boys Tire and Service Center occupies an historic building (see Section 3.17). The other six businesses include:

- Old Town and Country Gas Station and Convenience Store
- Teton Loans
- Nissan Store
- The Burger Place
- Sun Country Awnings
- Liberty Realty

Of the Build alternatives, Alternative One directly impacts the most buildings and would have the greatest economic direct impact to businesses along Telegraph Street. Many retail and commercial developments have already been built or are in the planning stages within only a few miles of Telegraph Street, and some space is still available at the MP 10 retail and commercial development area. If any affected business decided to relocate, it could likely relocate within Washington City.

There would be temporary indirect impacts to the City's tax base while these businesses are closed for relocation. The customers who frequent these businesses would also be temporarily directly impacted, forcing them to either patronize other stores with similar goods or wait for the business to reopen at its new location.

Permanent indirect impacts could include the loss of tax revenue to the City from businesses that decide not to reopen or that reopen in another location, such as St. George. Customers of businesses that relocate outside the project study area would also be directly impacted and confronted with the choice to travel greater distances or find a comparable business in Washington City. Because most of the existing shopping areas in Washington City and nearby St. George are just a few miles from Telegraph Street and would most likely be able to provide comparable goods or services, the direct impacts resulting from the potential relocations that occur are not likely to be substantial. The closing and potential relocation of businesses could directly impact those who do not drive or who currently walk to businesses along Telegraph Street. If the affected business does not relocate nearby, this group of customers would be adversely affected, because there is no public transportation in Washington City.

Alternative One would remove one of the gas stations within the project study area (Old Town and Country). Because there are only two gas stations along this part of Telegraph Street, this would likely have a positive direct impact on the remaining gas station (First Stop) by reducing nearby competition and increasing business. Because Sun Country Awnings is a unique business in the area, it may be more difficult for its customers to find comparable products nearby if the business chooses not to reopen at a new location.

Alternative One – Narrow

Alternative One – Narrow would permanently directly impact three businesses along Telegraph Street (9 percent of the businesses on Telegraph Street). In addition to

requiring the potential relocation of the Burger Place, affected business would be the Good Ol' Boys Tire and Service Center and the Nissan Store. Refer to the discussion above in Alternative One for a review of the direct and indirect impacts from these potential relocations or closures.

Alternative Two

Alternative Two would permanently directly impact five businesses along Telegraph Street (15.6 percent of the businesses on Telegraph Street). Affected businesses would include the Burger Place, First Stop Food Mart, Mike's Barber and Beauty Shop, Good Ol' Boys, and Old Town and Country Gas Station. This alternative would relocate both of the remaining gas stations within the project study area, making it less convenient for current customers to get fuel. Closure of these gas stations would likely increase business at competing stations located outside of the project study area near the MP 10 retail shopping area.

The potential relocation of Good Ol' Boys could result in increased business to Cooper Tires, as it would still be located on Telegraph Street.

Mike's Barber and Beauty Shop (Mike's) would also potentially require relocation for this alternative. Because Washington City is still developing shopping areas (regional and local), it is likely that Mike's would be able to relocate within the city.

Alternative Two – Narrow

Alternative Two – Narrow would permanently directly impact 6.25 percent of the businesses along Telegraph Street in the project study area. This Build alternative would directly impact the Burger Place and the First Stop in the same way as discussed in the previous alternatives.

Alternative Three – Narrow (Preferred Alternative)

Alternative Three – Narrow (Preferred Alternative) would directly impact 6.25 percent of the businesses along Telegraph Street in the project study area. The direct impacts to the Nissan Store and the Burger Place are discussed in greater detail in Section 3.3.2.

Impacts to the Burger Place were discussed in the alternatives above and would be the same for this alternative.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant economic impacts.

3.4.4 Mitigation Measures

Property acquisition will be obtained according to Federal guidelines and UDOT policies that include fair compensation measures for property owners. UDOT will comply with Title VI of the Civil Rights Act of 1964 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. In some circumstances, property owners may request an advance purchase if it can be shown that the owner will suffer a hardship if the land purchase is delayed until after the project has been formally approved.

As a safety measure, barrier-type medians are planned in certain locations to reduce accidents resulting from left turns and U-turns at intersections and from conflicting mid-block left turns. Median placement will be coordinated with the local planning and engineering departments to determine appropriate access points so as not to inhibit future development and to reduce impacts to existing businesses and residences.

Access to businesses along Telegraph Street will remain open during construction of any of the Build alternatives.

3.5 Pedestrians and Bicycles

3.5.1 Regulatory Setting, Studies, and Coordination

The Washington City General Plan calls for the City and the citizens to make the Historic Downtown area a pedestrian-oriented area, stating: “Provide mechanisms for the development of a traditional, pedestrian-oriented downtown on Telegraph Road between 300 West and 300 East.” The City’s General Plan also includes some information about bicycle use in the downtown area. Bike routes are not planned for Telegraph Street. However, it is the City’s plan to develop clearly defined bike routes, trails, and paths or lanes to access the Historic Downtown area.

Section 217 of Title 23 of the U.S. Code calls for the integration of bicycling and walking into the transportation mainstream. FHWA encourages the development and implementation of bicycle and pedestrian plans as part of the overall transportation planning process, and helps coordinate the efforts of Federal, State, metropolitan and other agencies to improve conditions for bicycling and walking.

Title II of the Americans with Disabilities Act (ADA) (1990) requires UDOT to apply specific access design standards, developed by the U.S. Access Board, when constructing or altering pedestrian facilities. The ADA Accessible Guidelines call for curb ramps to be provided wherever an accessible route crosses a curb.

In February 2001, UDOT approved The Statewide Pedestrian and Bicycle Plan as an element of the Utah Department of Transportation Statewide Long Range Transportation Plan.” This plan provides guidance when considering pedestrians and bicyclists. Because UDOT believes in designing Context Sensitive Solutions for projects, the Department would take into account the desires of Washington City to create a pedestrian-oriented design for the proposed action.

Washington City is currently working on a bicycle route plan for the entire City. At this time, no routes are planned along Telegraph Street.

3.5.2 Affected Environment

Currently, Telegraph Street does not have bicycle lanes, and the shoulder is too narrow to accommodate bicycles (2-foot width). The sidewalks along Telegraph Street between 500 West and 300 East are approximately 5 feet wide with no park strips.

The sidewalks are currently substandard and present a safety issue for pedestrians and persons with disabilities. To become compliant with ADA pedestrian access, the sidewalks would need to be widened or separated from the traffic in accordance with current standards.

The Mill Creek Trail is an unpaved north-south trail along Mill Creek that is used by pedestrians and bicyclists. A large opening for the trail under the Mill Creek Bridge lets users avoid Telegraph Street traffic by crossing under the roadway.

3.5.3 Impacts

3.5.3.1 No Build Alternative

The condition of Telegraph Street would remain the same as it is now. No other projects are anticipated at this time that would upgrade the bicycle or pedestrian facilities along this road.

Traffic would continue to increase along Telegraph Street, causing increased congestion. The increased congestion, a direct impact, could make it harder for pedestrians and bicyclist to cross Telegraph Street safely. As traffic congestion increases, it is likely that air quality would decrease, a direct impact, which could make Telegraph Street a less desirable route for pedestrians and bicyclists.

3.5.3.2 Build Alternatives

All of the Build alternatives would directly impact pedestrian and bicycle considerations in the same manner. Direct impacts from the construction of a wider road in the proposed project area would include increased safety for pedestrians because of sidewalks with park strips. The shoulders would not be widened as part of this proposed action. No bicycle routes are planned along Telegraph Street within the project study area.

The narrow shoulder width would create safety issues, a direct impact, for bicyclists who attempt to use Telegraph Street within the project study area and could lead to bicyclist and motorist accidents. Please refer to the mitigation commitments in Section 3.5.4 for a discussion on bike routes.

Indirect impacts could include more pedestrian use along Telegraph Street because of the improved facilities. Improved sidewalks may generate additional walk-in traffic for businesses.

Pedestrians could feel safer walking along Telegraph Street within the project study area because there would be an additional separation between the pedestrians and the traffic. This would be a 4-foot park strip that will most likely be landscaped as well.

There could be negative direct impacts to the elderly, disabled, and school children trying to cross the wider road. Because the road would be wider, it would likely take a longer period of time to cross. This could cause a greater potential for accidents between those crossing the street and vehicles.

Raised medians are proposed for all of the Build alternatives. These medians would make it so that people have to cross Telegraph Street at intersections where designated pedestrian crossings are provided. The indirect impact would be longer travel times for some people. This could be an added burden to the elderly, disabled, and school children who would have to travel further to reach their destination.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to pedestrian and bicycle facilities.

3.5.4 Mitigation Measures

Washington City is preparing a Trails Master Plan that will include bike and pedestrian routes. Although the plan currently does not include any routes on Telegraph Street, the City is planning bike routes that will use other, safer routes for travel. In the future, as other east-west travel routes are created, the City may choose to revisit the traffic design of Telegraph Street and introduce bicycle facilities. In the meantime, 100 North and 100 South are lower volume streets that provide an alternative route for bicycles.

In addition, crosswalks will be painted and raised medians at various locations along the corridor will provide a haven to those crossing the roadway. Other potential mitigation measures include:

- Signal timing to allow for safe crossing at stop lights
- Countdown signals for pedestrians
- Flags for pedestrians to use while crossing
- Refuge for pedestrians in the median at crossing areas

3.6 Air Quality

3.6.1 Regulatory Setting, Studies, and Coordination

The Clean Air Act (CAA) (42 U.S.C §§ 7401-7671q), as amended in 1990, is the Federal law that regulates air quality. It sets standards for the quantity of pollutants that can be in the air. At the Federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS are set by the Environmental Protection Agency (EPA) and are the standards that have been established as the official ambient air quality standards for Utah. These standards include both the primary standards to protect public health and secondary standards to protect public welfare (such as protecting property and vegetation from the effects of air pollution). Standards have been established for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter that is 10 microns in diameter or smaller (PM₁₀), and particulate matter that is 2.5 microns in diameter or smaller (PM_{2.5}).

The CAA requires that all areas with consistent, widespread violations of the NAAQS be designated non-attainment areas. Non-attainment areas are areas out of compliance with the established air quality standards.

The Utah Division of Air Quality (UDAQ) is responsible for permitting air pollutant sources and for enforcing emissions to satisfy the NAAQS requirements. UDAQ is also responsible for coordinating with EPA to specify non-attainment areas, and for preparation of the State Implementation Plan and Maintenance Plans.

The proposed Telegraph Street project is included in a currently conforming Long Range Transportation Plan and has not been significantly changed. The proposed project is in conformity at the regional level.

In addition to the criteria air pollutants, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, national low emission vehicle (NLEV) standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, proposed heavy duty engine and vehicle standards, and proposed on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 to 65 percent, and will reduce on-highway diesel PM10 emissions by 87 percent.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs.

3.6.2 Affected Environment

The proposed project study area is within Washington City, which is in Washington County, Utah. It has been shown that climate relates to air quality. The general temperatures in the area range from 100 degrees Fahrenheit in the middle of summer to 30 degrees in the coldest part of winter. The average annual precipitation is approximately 8 inches a year, and snowfall is only about 3 inches a year with usually no accumulation (Utah Center for Climate and Weather, 2006).

Washington County is currently an attainment area for Utah. This means that it does not exceed any of the emission levels for Criteria Pollutants. Criteria pollutants addressed in the 1999 State Summary Table from Utah Division of Air Quality include PM10, PM2.5, Sulfur Oxide (SOx), Nitrogen Oxides (NOx), Volatile organic compounds (VOCs), and CO. A brief description of each emission type is listed below.

Particulate Matter 10 (PM10) is any solid or liquid particle less than 10 microns in diameter suspended in the air. They can impair visibility and cause soiling of materials. PM10 irritates the sensitive lung tissue and can block small airways, causing reduced breathing capacity of the lungs.

Particulate Matter 2.5 (PM_{2.5}) is any solid or liquid particle 2.5 microns or smaller in diameter suspended in the air. These particles are referred to as “fine” particles and are believed to pose the largest health risk. Because of their small size (less than one-seventh the average width of a human hair), fine particles can lodge deeply into the lungs.

Sulfur Oxide (SO_x) is an invisible gas with a pungent odor. At low concentrations, this gas can often be tasted before smelled. The major source of SO_x is the combustion of sulfur-containing fuels, primarily coal and fuel oil. Sulfur dioxide is a toxic substance that can impair breathing.

Nitrogen Oxides (NO_x) are chemicals formed in high-temperature combustion processes. These chemicals are toxic by themselves and can react to form ozone or PM₁₀ in the form of nitrates, like NO₂. NO₂ is brownish-red gas with a biting odor. It is highly irritating in high concentrations. NO₂ is always accompanied by nitric oxide (NO).

Volatile organic compounds (VOCs) are any compound of carbon (other than carbon monoxide, carbon dioxide, carbonic acid, carbonates, metallic carbides, and ammonium carbonate) that participates in atmospheric photochemical reactions. A company must report all reactive VOC emissions (including fugitive emissions). VOC emissions that are non-reactive are not reported.

Carbon Monoxide (CO) is a colorless, odorless, very toxic gas resulting from incomplete combustion. CO can reduce the oxygen content of the blood. It also causes dizziness, headaches, blurred vision, and slowed reactions.

3.6.3 Impacts

This EA includes a basic analysis of the likely MSAT emission impacts of this proposed action. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EA. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information: (Appendix C of the FHWA Memorandum Information: Interim Guidance on Air Toxic Analysis in NEPA Documents – February 2006).

3.6.3.1 Information that is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this proposed action.

- **Emissions:** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model – emission factors are projected based on a typical trip of 7.5 miles and on average speeds for this typical trip. This means MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects; it cannot adequately capture emissions effects of smaller projects. For PM10, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both PM10 and MSATs are based on limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM10 under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion:** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of CO to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area than a general regional prediction. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.
- **Exposure Levels and Health Effects:** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of

MSATs near roadways and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. These are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs; this is due to factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

3.6.3.2 No Build Alternative

Air quality under the No Build Alternative would be directly affected, and continue to decline as traffic volumes continue to increase. Congestion would increase, causing more idle time and more unwanted emissions.

3.6.3.3 Build Alternatives

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions – if any – from the various Build alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA: *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*. Appendix B of the FHWA Memorandum, Information: Interim Guidance on Air Toxic Analysis in NEPA Documents – February 2006, was used as a reference for most of the information contained in this Build alternatives impacts discussion.

All of the Build alternatives would increase the estimated vehicle miles traveled (VMT) by the same amount. This is because the Build alternatives are all designed with the same widening, just different alignments. Because the estimated VMT under each Build alternative is the same, no differences are expected in overall MSAT emissions among the various alternatives. Also, regardless of the Build alternative chosen, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures.

However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the proposed project Build alternatives would have the effect of moving some traffic closer to nearby homes and businesses; therefore, under each Build alternative, there may be localized areas where ambient concentrations of MSATs could be higher under the Build alternatives than the No Build alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No Build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build alternative could be higher relative to the No Build alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs would be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial reductions over time that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

None of the proposed Build alternatives are likely to create a criteria emission that would exceed the current acceptable values within Washington County. All of the Build alternatives are designed to increase the flow of traffic through the area and decrease congestion. A decrease in congestion and idle time should not increase emissions. Emissions become a problem in traffic when traffic flow is interrupted or slowed significantly, because the cars will idle in one place longer than usual, thereby increasing the emissions in the area.

This project is located in Washington County and so is not located in an EPA-designated non-attainment or maintenance area for PM10 or PM2.5. While there is no requirement for additional PM10 or PM2.5 hot spot analysis, included here is a discussion of future conditions, including thoughtful consideration of factors such as possible future land uses like gravel pits, future construction projects, changes in traffic patterns and volumes, street sanding and sweeping, and changing meteorological conditions.

Construction projects are planned in many areas of Washington City over the next several years. These projects will likely increase the volume of PM10 and PM2.5 emissions within the project study area as well as regionally, this would be a direct and indirect impact. Additionally, traffic is likely to continue to increase within Washington City as the city continues to grow and develop new areas for business, recreation, industrial, and residential uses. The increase in traffic would likely lead to an increase in PM10 and PM2.5 emissions in the future.

During construction, a direct impact could be higher emission values along this stretch of road because of construction equipment, but this would be a temporary increase and

should not impact the overall attainment area. Pedestrians could temporarily feel some of the effects from the compounds listed above if they were to spend a long period of time within a construction zone. The direct impacts should be temporary and dissipate once the individual has left the construction zone.

This proposed action is outside of a non-attainment or maintenance area for CO. While there is no requirement for additional CO hotspot analysis under transportation conformity rules, NEPA requirements still apply, and it must be proved with, reasonable certainty, that the Telegraph Street project would not cause an exceedance of CO. For the proposed project, that verification comes from the analysis done with respect to traffic volume screening. Based on exhaustive sensitivity testing done for the UDOT for their Air Quality Hotspot Manual (May 2003), it has been determined that traffic volumes in the range of 50,000 vehicles per day (vpd) do not cause CO levels to increase to the point of violating the NAAQS 1-hour or 8-hour standards. This proposed action's anticipated future volumes are 29,000 vpd, so no violation of the standard is anticipated.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to air quality.

3.6.4 Mitigation Measures

The following Best Management Practices are recommended during construction:

- Wetting stockpiles as needed to decrease fugitive dust
- Possibly using chemical dust suppressants
- Minimizing the amount of disturbed surface
- Avoiding construction on windy days
- Using street sweepers and water spray
- Ensuring all construction equipment is in proper working order
- Ensuring construction zones are closed to the general public

3.7 Noise

3.7.1 Regulatory Setting, Studies, and Coordination

Traffic noise has the potential to impact daily activities and the quality of life for people living near streets and highways. Traffic noise levels depend on traffic volume, speed, and type. Vehicle noise is produced by the engine, exhaust, and tires. Factors such as vegetation, terrain, and obstacles can also affect the level of traffic noise. Typically, traffic noise is not a problem for people living more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2003).

All sound level measurements and estimates in this document are reported as Leq(h) in units of decibel (dB) and are A-weighted. A decibel is a unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain level. The Leq describes the receiver's average noise exposure from all events over a given period of time. Leq(h) is the hourly value of Leq. The "A" indicates that the sound has been filtered to reduce the strength of very low- and very high-frequency sounds, much as the human ear would hear. On the average, each A-weighted sound level increase of 10 dB corresponds to an approximate doubling of subjective loudness.

An example of typical ambient noise levels in the environment is shown in **Figure 3.4**. The unit of measurement Ldn represents the A-weighted Leq for a 24-hour period with an added 10 dB penalty for noise that occurs between 10 pm and 7 am.

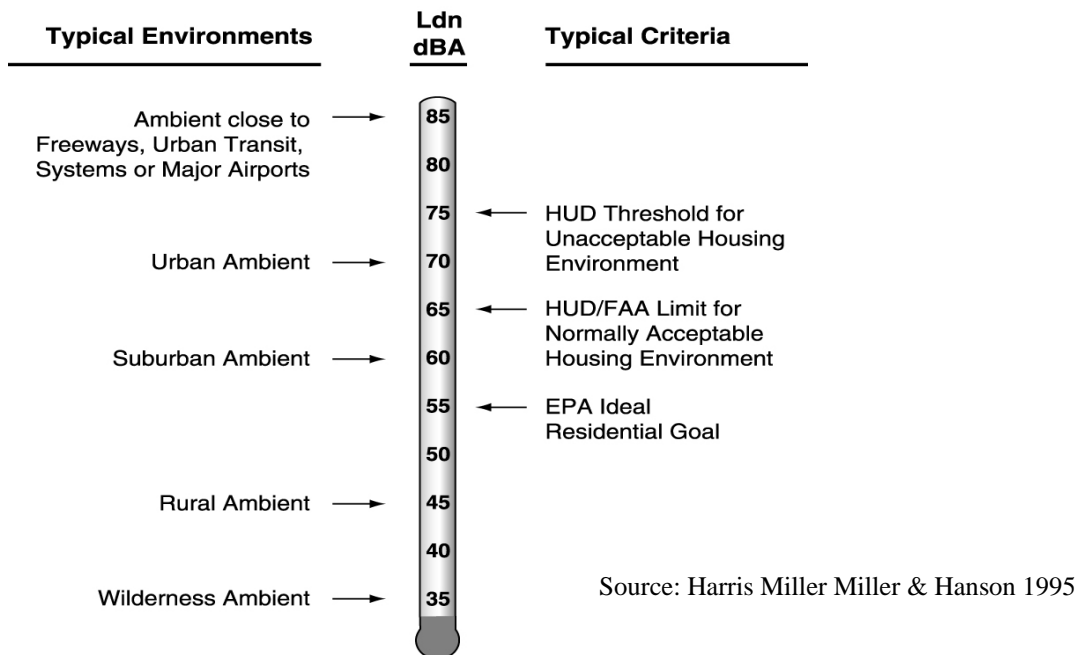


Figure 3.4 Examples of Typical Outdoor Noise Exposure

UDOT considers noise impacts based on FHWA Noise Abatement Criteria (NAC) (23CFR772). FHWA requires all states to define at what value a predicted noise level approaches the NAC defined in 23 CFR 772, and, thus, results in a noise impact (FHWA 1995). UDOT has defined "approach" as 2 dBA less than the FHWA NAC for use in identifying traffic noise impacts in traffic noise analyses. The UDOT NAC are shown in **Table 3.7**.

Two types of noise levels occurring at sensitive land use areas are considered impacts under the UDOT criteria (UDOT 2006):

- The design level is greater than or equal to the UDOT NAC shown in **Table 3.7** for the respective activity category.
- The design level is greater than or equal to an increase of 10 dBA over the existing noise level, regardless of the existing noise value.

Therefore, if a project predicts a noise level equal to the values shown in the following table, or a noise level greater than 10 dBA over existing levels, some sort of abatement must be considered for the project in the appropriate locations. In some locations, however, abatement may not be feasible or reasonable.

UDOT considers a severe traffic noise impact to be an increase of 30 dBA or more over existing residential noise levels, or a predicted absolute noise level of 80 dBA or more (UDOT 2006).

Table 3.7 UDOT Noise Abatement Criteria

Category	Leq - dB(A)*	Description of Activity Category
A	55 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve the intended purpose
B	65 (Exterior)	Picnic areas, recreational areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	70 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above
D	None	Undeveloped lands
E	50 (Interior)	Residences, hotels, motels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

*Hourly A-weighted sound level, reflecting a 2dBA approach value below 23CFR772
Source: UDOT 2004

3.7.2 Affected Environment

The majority of the project study area includes residential and commercial land uses. Residential areas, as well as parks, recreation areas, places of worship, hotels, motels, hospitals, schools, and libraries are all included in category B land uses.

Existing ambient noise levels along the affected routes were determined by direct measurements at various locations in residential or commercial areas. Short-term measurements were taken at the selected sites near a building (or a proposed building development) to represent areas of frequent human activity. Refer to Table 6 in **Appendix A** (Noise Report) for a list of the dBA by receiver location for the existing conditions, the No Build Alternative, and Alternative Three – Narrow (Preferred

Alternative). Alternative Three – Narrow (Preferred Alternative) is the only Build alternative shown as all of the Build alternatives would have similar conditions.

A full copy of the noise analysis report is included in the **Appendix A** of this document. Both the 65 dBA and 70 dBA noise contours are shown in the figures for the noise analysis report.

Two measurements were taken along the affected route. The measurements were recorded on mild, calm weekdays using a Quest Technologies 2900 integrating and logging sound-level meter. Prior to measurements, the meter was calibrated using a Quest Technologies QC-10 sound calibrator. Relevant data, such as traffic volumes, vehicle types, and traffic speeds were collected for verification of FHWA's Traffic Noise Model (TNM). The existing noise measurements are shown in **Table 3.8**.

Table 3.8 Existing Ambient Noise Measurements

Address	Existing Leq(h), dBA*
East of Airplane Museum	71.3
Between 100 West and Main Street	68.7

* dBA = A-weighted decibel level

Table 3.9 summarizes the audible differences perceived by most people associated with changes in decibel levels.

Table 3.9 Decibel Increase vs. Audible Difference

Decibel Increase	Audible Difference
1 dBA	No perceptible change
3 dBA	Barely perceptible change
5 dBA	Readily perceptible change
10 dBA	Perceived as twice as loud

Source: UDOT 2006

3.7.3 Impacts

3.7.3.1 No Build Alternative

An indirect impact created from the No Build alternative would be in the increase in traffic congestion. As traffic congestion increases, the average speed of motor vehicles tends to decrease. A decrease in the speed of traffic would cause a decrease in traffic noise levels.

3.7.3.2 Build Alternatives

Existing noise levels were characterized and future 2030 noise levels were modeled to determine possible traffic noise direct impacts associated with Alternative Three – Narrow (Preferred Alternative). The Alternative Three – Narrow (Preferred Alternative) was used to model the noise impacts; however, because all of the Build alternatives are very similar in design, it is assumed that the other Build alternatives would have the same direct impacts. In addition, potential noise abatement strategies were considered for mitigating roadway noise impacts. This process was completed according to State and Federal noise policies and regulations. Direct noise impacts were calculated using the FHWA TNM Version 2.5 computer program. Receivers were placed in specific locations along Telegraph Street, between 500 West and 300 East, to assess each of the proposed Build alternatives.

Future 2030 noise model runs for Alternative Three – Narrow (Preferred Alternative) and the No Build alternative were based on the existing model setup. For Alternative Three – Narrow (Preferred Alternative), the existing model was modified based on the proposed roadway improvements for that alternative. Year 2030 peak hour traffic volumes were used to represent the worst hourly traffic-noise conditions for modeling purposes, because they represent a higher noise level than the LOS C volumes. The No Build alternative model run used the existing roadway configuration and the 2030 traffic data. Receivers were primarily placed near buildings or outside residential areas such as backyards and patios where residents may be exposed to traffic noise.

For purposes of assessing noise associated with each alternative, noise receivers were placed in specific locations along the corridor. Noise receivers are specific locations modeled in the TNM software. Receiver locations are often used to represent similar geographically located sites known as receptor sites. Please refer to **Appendix A** for a map showing noise contours for Alternative Three – Narrow (Preferred Alternative) and the location of the noise receptors.

Table 3.10 summarizes the number of directly impacted receptor sites by alternative based on readings obtained from the receivers in the model. For example, under the No Build alternative, along Telegraph Street, out of the 28 potential receptor sites evaluated, 23 receptor sites would experience noise levels below 65 dBA (Category B) or 70 dBA (Category C); the remaining 5 receptor sites would experience noise levels equal to or exceeding 65 dBA (Category B) or 70 dBA (Category C). The table also indicates the total number of receptor sites that would experience noise levels at or over the NAC, and the number of receptors that could achieve a 5 dBA or greater noise reduction with the use of noise barriers.

Table 3.10 Number of Receivers Above and Below NAC by Existing Conditions and by Select Alternatives

	Existing	No Build	Three – Narrow (Preferred Alternative)
No. receptor Sites \geq NAC ¹	3	5	8
No. receptor Sites <NAC	25	23	20
No. of receptor sites that could achieve 5 dBA or greater mitigation	N/A ²	N/A	3
Total No. receptor Sites	28	28	28

¹NAC = Noise Abatement Criteria. See **Table 3.7**.²N/A = Not Applicable – Noise Mitigation was not considered.

Indirect noise impacts may include increased noise levels associated with increased residential and commercial development resulting from any of the Build alternatives. These impacts are not quantifiable but can reasonably be expected to occur.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant noise impacts.

3.7.4 Mitigation Measures

The UDOT Noise Abatement Policy (UDOT 2006) states that noise abatement will only be considered if the proposed noise barrier would achieve a minimum 5 dBA noise reduction for a majority of front-row receivers under future conditions, and the cost would not exceed \$25,000 per benefited receiver. Safety and maintenance issues must be considered for a feasible design of a noise barrier. In addition, noise abatement will only be considered if a balloted vote reveals 67 percent of impacted residents (including 75 percent of front-row receivers) are in favor of the abatement. Balloting of affected residents will be conducted prior to the final environmental document approval.

This section contains an evaluation of noise walls for mitigation. The June 16, 2006 UDOT policy provides noise walls only for Interstate or Limited Access Highways; however, this policy is not yet accepted by FHWA. Because the policy has not yet been accepted, the noise walls are a possibility.

Based on the noise levels from the TNM model, eight receptor locations were identified that are expected to exceed the NAC for Alternative Three – Narrow (Preferred Alternative). These identified receptor locations are represented by receiver numbers R8, R10, R19, R23, R24, R26, R28, and R30. Four of these eight receptor locations (receivers R8, R10, R23, and R28) have direct access to Telegraph Street via driveways. Gaps in noise walls caused by driveways negate a wall's effectiveness to reduce noise. Therefore, these locations with direct access cannot be mitigated with noise barriers. Such locations were not considered feasible or reasonable and were not analyzed for noise barriers.

The receptor location represented by receiver R24 is a potential acquisition under the Alternative Three – Narrow (Preferred Alternative) and was not analyzed for noise barrier mitigation.

The edge of Nisson Park that is adjacent to Telegraph Street is expected to have noise impacts. Approximately 15 percent of the area of the park would be impacted by noise. The impacted area is not a high-use area of the park and, therefore, was not analyzed for noise barrier mitigation.

Retail receivers were not modeled for noise levels. Retail sites typically desire highly visible locations and require direct access to the main roadway.

Based on the number of receivers with a reading above the NAC value, a total of three noise barrier locations were identified for Alternative Three – Narrow (Preferred Alternative) along the corridor. These locations are near receivers R19, R26, and R30. The TNM model was used to estimate the effectiveness of noise barriers by running the model with and without the proposed noise barriers. **Table 3.11** shows the results from the noise model by alternative for each of the receiver locations used to assess the effectiveness of the barriers.

Table 3.11 Receiver Noise Level Model Results by Alternative Three – Narrow (Preferred Alternative)

Barrier #	Receiver #	Alternative Three – Narrow (Preferred Alternative)		
		No Wall	With Wall	Leq Reduction With Wall
1	19	70.9	61.1	9.8
2	26	69.5	63.1	6.4
3	30	68.7	63.7	5.0

Source: URS 2006

Three potential noise barriers were analyzed at residential locations to determine the physical feasibility and the economical reasonableness of the barriers. The three barriers meet the UDOT criteria of both a 5 dBA or more noise reduction and \$25,000 per benefited residence. The proposed noise barrier locations for Alternative Three – Narrow (Preferred Alternative) are summarized in Table 3.12.

Table 3.12 Potential Noise Barriers for Alternative Three – Narrow (Preferred Alternative)

Barrier Location	Barrier No.	No. of Benefited Receptor Sites	Average dBA Reduction / Receptor Site	Barrier Height (ft)	Barrier Length (ft)	Barrier Area (ft ²)	Barrier Cost ^a (\$)	Cost Per Benefited Site ^b (\$)	Criteria Met? Y or N
Apartment Buildings South of Telegraph Street Between 200 West and 100 West	1	2	9.8	8	210	1680	\$20,160	\$10,080	Y
Residence on Southwest Corner of Telegraph Street and 100 East	2	1	6.4	8	140	1120	\$13,440	\$13,440	Y
Residence South of Telegraph Street Between 100 East and 200 East	3	1	5.0	8	130	1040	\$12,480	\$12,480	Y

The following sections contain descriptions of the noise mitigation walls for Alternative Three – Narrow (Preferred Alternative).

3.7.4.1 Apartment Buildings on Telegraph Street between 200 West and 100 West (South Side of Street)

A barrier was modeled for two apartment buildings on Telegraph Street between 200 West and 100 West (south side of street) to determine the noise benefits. The barrier would be constructed in two pieces that would total approximately 210 feet long and 8 feet tall. A 9.8 dBA reduction per building could be obtained by constructing the barrier. The cost of the noise barrier would be \$10,080 per benefited building. The barrier would achieve the UDOT feasibility standard of 5 dBA or greater noise reduction for the majority of front-row receivers, and it would meet the \$25,000 cost-reasonableness criteria per benefited receiver.

3.7.4.2 Residence on Southwest Corner of Telegraph Street and 100 East

A barrier was modeled for a single residence on the southwest corner of Telegraph Street and 100 East to determine the noise benefits to one residence. The barrier would be approximately 140 feet long and 8 feet tall. A 6.4 dBA reduction could be obtained by constructing the barrier. The cost of the noise barrier would be \$13,440. The barrier would achieve the UDOT feasibility standard of 5 dBA or greater noise reduction for the majority of front-row receivers, and it would meet the \$25,000 cost-reasonableness criteria per benefited receiver.

3.7.4.3 Residence on South Side of Telegraph Street between 100 East and 200 East

A barrier was modeled for a single residence on the south side of Telegraph Street between 100 East and 200 East to determine the noise benefits. The barrier would be approximately 130 feet long and 8 feet tall. A 5.0 dBA reduction could be obtained by constructing the barrier. The cost of the noise barrier would be \$12,480. The barrier would achieve the UDOT feasibility standard of 5 dBA or greater noise reduction for the majority of front-row receivers, and it would meet the \$25,000 cost-reasonableness criteria per benefited receiver.

3.7.4.4 Sight Distance and Safety Requirements for Noise Mitigation

According to AASHTO standards, in order for a vehicle to safely turn right from a stop condition for any alternative, it will need 385 feet of unobstructed view. The placement of noise barrier at any of the three locations listed above will prevent this. Therefore, noise barriers are considered not feasible.

3.8 Geology, Soils, and Topography

3.8.1 Regulatory Setting, Studies, and Coordination

No specific Federal or State legislation has governing authority over the geology, soils and topography of Utah. Local cities and counties typically address these resources through zoning.

The Washington City General Plan states “public safety must be preserved by assuring that stability is properly maintained on any development of hillsides and/or slopes, and that problem soils are properly mitigated.” It also states that aesthetic qualities of the hillsides shall be preserved by minimizing the amount of hillside excavation; it further requires that where hillside excavation occurs, cuts must be fully reclaimed to a natural appearance through re-grading and landscaping, or screening from general view by buildings. There are no other policies within the General Plan that provide guidance for geology, soils, and topography.

3.8.2 Affected Environment

The general landscape in Washington City is unique. It is composed of red sandstone and black lava rock hillsides that are natural assets to the community. The hillsides and plateaus provide a scenic backdrop to the city and provide the most defining physical characteristic for the area. The formations consist of red sedimentary rock that has been carved into mesas, buttes, and narrow canyons. Some of the bluffs are capped by basalt. These basalt caps were formed 2.3 million to 20,000 years ago from lava that flowed

intermittently from small nearby volcanoes. The basalt is more resistant to erosion than red sandstone and shale, and so the sandstone eroded faster, leaving the basalt capped hills behind.

The most dominant feature in the project study area is Mill Creek. Telegraph Street is in a sort of valley between bluffs in the proposed project study area. The roads appear to be mostly level, but generally slope towards Mill Creek.

The soils in the project study area consist of sand, sandy loam, and silty clay loam. The soils are sandy from 500 West until about 100 West under both Telegraph Street and 100 South. From approximately 100 West to 300 East, the soils under the streets are a silty clay loam. Below is a description of the soil types in the project study area (Soil Survey, 1977):

- Gullied Land – Gullied land (GA) consists of areas that are cut by gullies, and any soil profiles have been destroyed. These areas support little or no vegetation and have no value for farming. Most have shallow soil material, but leveling is not practical. Gullied land is suited to limited use for grazing and wildlife habitat.
- Fluvaquents and Torrifluvents, Sandy (FA) – Fluvaquents and Torrifluvents, Sandy (FA), are on floodplains of the Virgin River, mainly in the area of Hurricane and St. George. This area is about 60 percent Fluvaquents and 40 percent Torrifluvents.

Fluvaquents are in swales and oxbows, and Torrifluvents are on slightly higher terraces and benches, mostly along the edges of the floodplain.

Fluvaquents are deep, somewhat poorly drained and poorly drained soils that formed in sandy alluvial deposits derived from sandstone, limestone, and shale. Slopes range from 0 to 2 percent. Fluvaquents are dominantly fine sand and are commonly stratified with fine sandy loam, silt loam, and loamy fine sand. Depth to the water table fluctuates with the water level of the river. During periods of high runoff, many areas of Fluvaquents are flooded for short periods of time. High runoff can occur in winter, spring, or late summer. Permeability is rapid, runoff is slow, and the hazard of erosion is severe.

Torrifluvents are deep, well-drained and moderately well-drained soils that formed in alluvial deposits derived from sandstone, limestone, and shale. Slopes range from 0 to 3 percent. Torrifluvents are dominantly loamy fine sand and fine sandy loam stratified with silt loam and loam. Depth to water table fluctuates with the water level of the river, but normally is more than 40 inches. Permeability is rapid, runoff is slow, and the hazard of erosion is moderate to severe.

- Tobler Fine Sandy Loam (Tc) – This soil is on alluvial fans, in alluvial valleys, and on desert slopes. Slopes are 1 to 5 percent. Permeability is moderately rapid, runoff is slow, and the hazard of erosion is moderate. Available water capacity is 6.0 to 7.5 inches. The water supplying capacity is 5 to 6 inches.

- St. George Silty Clay Loam (Sc) – This well-drained soil is on floodplains of the Virgin River near Washington, St. George, and Hurricane. Slopes are 0 to 2 percent. These soils formed in alluvium washed from sandstone, siltstone, and shale. Permeability is moderately slow, runoff is slow, and the hazard of erosion is slight.
- Eroded Land, Shalet complex, warm (EB) – This consists of stratified shale and gypsum. Slopes are gently rolling to steep and are strongly dissected. Erosion is active, and sediment production is high. This complex is about 80 percent Eroded Land and 20 percent Shalet clay loam, warm, with 2 to 20 percent slopes. The gently sloping Shalet soil is in swales intermingled with Eroded Land.

3.8.3 Impacts

3.8.3.1 No Build Alternative

There are no direct or indirect impacts associated with the No Build alternative.

3.8.3.2 Build Alternatives

No natural landforms would be directly impacted by the construction of the proposed action. There would be one new bridge constructed over Mill Creek for all of the Build alternatives. An indirect impact from the construction of the bridge could be the increased erosion of the banks around Mill Creek.

Because the road would be wider after construction, an indirect impact from water runoff from the road would be greater. Runoff currently flows into Mill Creek. Erosion of the Mill Creek drainage could increase because of the additional stormwater runoff.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to geology, soils or topography.

3.8.4 Mitigation Measures

Mitigation measures will include the following:

- Develop Best Management Practices for erosion control, salinity management, and groundwater protection
- Strengthening the existing slopes along Mill Creek
- Reinforce new or improved outfalls to Mill Creek

3.9 Floodplains

3.9.1 Regulatory Setting, Studies, and Coordination

Executive Order 11988 (Floodplain Management) directs Federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Agencies actions must reflect consideration of alternatives to avoid impacts in floodplains and modify the proposed action to minimize such impact where impacts are unavoidable. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood.

A permit is required for any structure or activity that may adversely affect the flood regime of a stream within the flood zone. Local governments participating in the National Flood Insurance Program (NFIP) are required to review proposed construction projects to determine if they are in identified floodplains. If a project is located in a mapped floodplain, the local government must require that a development permit be obtained prior to construction.

3.9.2 Affected Environment

3.9.2.1 Channel and Bridge Location

Mill Creek is a perennial channel that is mostly sandy with an approximate width of 4 feet and a depth of 1 foot. The creek crosses the study area just west of 300 West. Washington City participates in NFIP, and the applicable Flood Insurance Rate Map shows an approximate zone A (100-year) floodplain defined in the area covering Mill Creek.

3.9.2.2 Watershed and Hydrology

Mill Creek is a perennial stream and part of the Virgin River drainage. It joins the Virgin River about 1.5 miles downstream of the Telegraph Street crossing. The watershed,

upstream of the bridge, is approximately 28 square miles (see **Figure 3.5**). The headwaters of the stream are located in the foothills of the Pine Valley Mountains with elevations over 5,500 feet above mean sea level. The stream is perennially fed by springs and exhibits peak flows due to seasonal precipitation. Average precipitation in the watershed ranges from 8 to 12 inches annually.

3.9.3 Impacts

No Build Alternative

No direct or indirect impacts to the floodplain are associated with the No Build alternative. The floodplain would remain unchanged.

Build Alternatives

The existing three-span bridge will be replaced with a clear span bridge in all of the Build alternatives. The span of the new bridge will be larger than the existing three-span. There are no expected concerns, and thus no direct or indirect impacts, for floodplain encroachment due to the bridge construction or the new bridge during high runoff periods. The extent of potential flooding in Mill Creek is expected to be limited to the channel area itself, which is where it is currently limited. Thus, the Build alternatives would not create any direct or indirect impacts to the floodplain.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to floodplains.

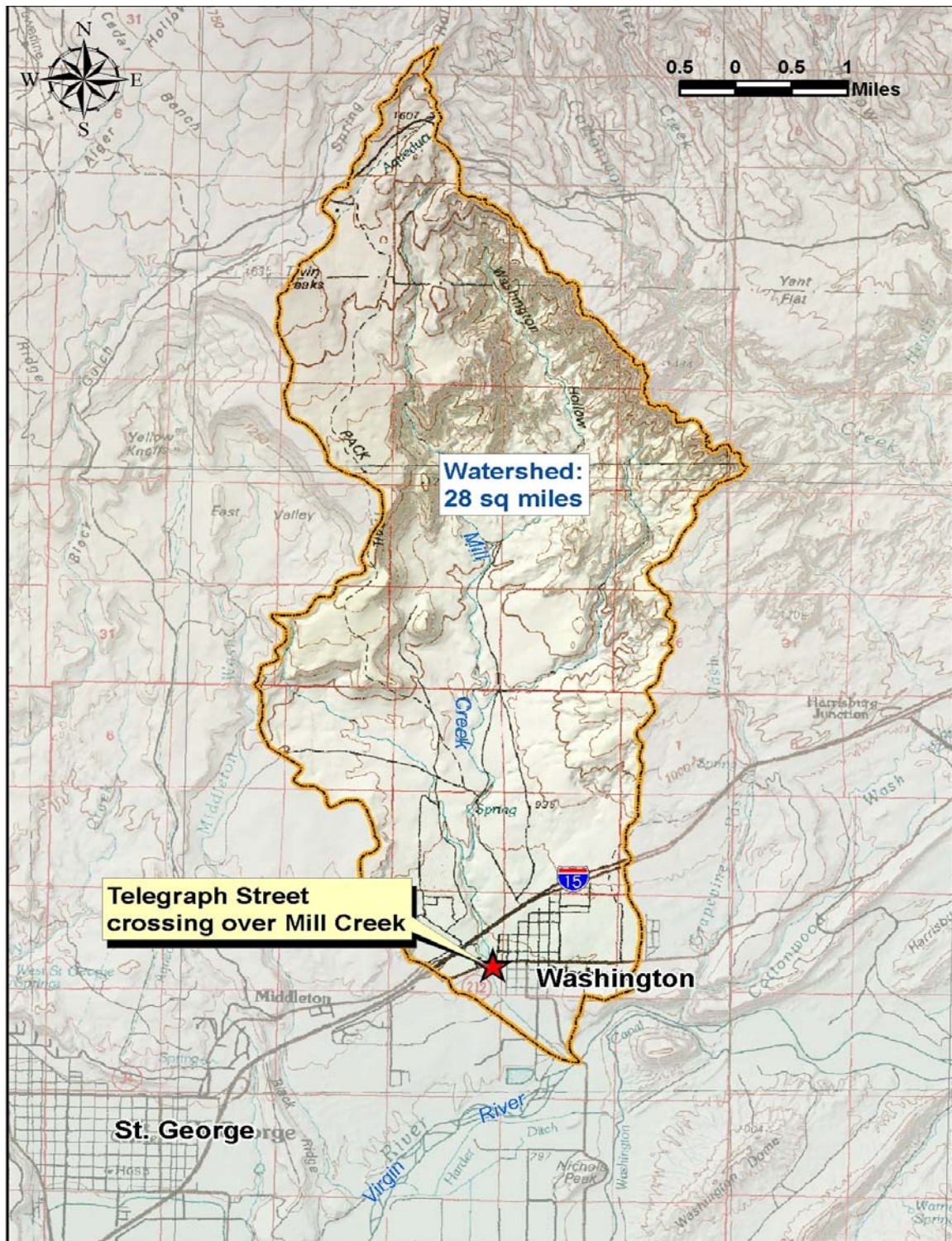
3.9.4 Mitigation Measures

Potential mitigation measures will include:

- Collecting and treating runoff from an the prior to its discharge into the floodplain
- Improving habitat values and functions through management and rehabilitation of any plant communities disturbed during construction
- Providing additional design features, such as steeper side slopes, guardrails, and wingwalls

3.9.5 Only Practicable Alternative Finding

None of the Build alternatives would affect the function of the floodplain; therefore, they are all considered practicable.



Source: URS 2006 (watershed delineated using WMS)

Figure 3.5 Mill Creek Watershed

3.10 Water Quality

3.10.1 Regulatory Setting, Studies, and Coordination

All project alternatives collect runoff on Telegraph Street east and west of Mill Creek and discharge all of this water to the creek. Consequently, Utah Pollutant Discharge Elimination System (UPDES) permitting will be required as part of the General Construction Permit. A Stormwater Pollution Prevention Plan (SWPPP) and a notice of intent for construction dewatering will need to be included in the General Construction Permit application.

Washington City's existing and proposed stormwater collection system may be used to convey all stormwater from the proposed action. This will require coordination with the City to ensure adequate capacity and permitting of the discharge. Alternatively, the proposed action could install a separate stormwater collection facility for the proposed project and discharge to Mill Creek.

The greatest potential water quality impacts are to Mill Creek, Washington County. The Washington County designation is needed because there are two other Mill Creeks in Utah. Mill Creek in Washington County is not listed as a 303(d) impaired water. Consequently, an evaluation of Total Maximum Daily Loads (TMDL) has not been completed for Mill Creek (Utah's 303(d) list of Impaired Water, 2004).

3.10.2 Affected Environment

The primary water source within the project study area boundaries is Mill Creek, a tributary to the Virgin River. Drainage from the proposed action would also discharge to Mill Creek. Because Mill Creek is not listed as a 303(d) impaired water, the water is of sufficiently high quality to meet all its intended uses. Although not specified by the State, intended uses would likely include both irrigation and recreation (human contact).

West of Mill Creek, off-site runoff is parallel to the project study area, resulting in the proposed project not intercepting or collecting off-site runoff. Within the project's study area boundary, a 24-inch diameter storm drain is proposed for Telegraph Street to collect stormwater from adjacent properties and to discharge it to Mill Creek (Washington City Stormwater Master Plan, 2005).

There is no principal or sole-source aquifer classified within the project study area according to the Aquifer Classification Maps prepared by the Division of Water Quality.

Six surface water rights diversion points are located within 1,000 feet of the project study area boundaries. There are no underground water rights. Surface water diversions for these rights could potentially be interrupted by the proposed action. Although not a water quality impact, designs would need to provide protection or potential relocation of these facilities if they are to be impacted by the proposed action.

3.10.3 Impacts

3.10.3.1 No Build Alternative

The water quality in the project study area should follow the same trend that it is currently following if a wider road is not constructed within the project study area. The water quality trend, without the construction of the proposed project, would be towards degradation of receiving waters with increases in sediment, dissolved solids, and oils associated with increased urbanization.

3.10.3.2 Build Alternatives

As stated above, surface water diversions for water rights could potentially be interrupted by any Build alternative. And, although this is not a direct water quality impact, it is mentioned in this section because of its relation to water quality and its potential to indirectly impact water quality. Designs would need to provide protection or potential relocation of any facilities that would be directly impacted by the proposed project.

Potential proposed action direct and indirect impacts to water quality from all of the Build alternatives are short and long term. The short-term potential direct impacts are contaminant spills and sediment loading of Mill Creek during construction.

The long-term direct impacts are:

- Oils and grease migration to Mill Creek
- Sediment loading to Mill Creek
- Spills of various contaminants on Telegraph Street that could migrate to Mill Creek

Long-term direct water quality impacts resulting from both stormwater collection alternatives are the same: direct discharge to Mill Creek. Washington City will be accepting the responsibility for the facilities upon completion of this proposed action and would consequently be responsible for the post-construction permitting of discharge to Mill Creek through either its existing system or a separate project-specific facility. This discharge of stormwater to Mill Creek should not decrease the current water quality of Mill Creek.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to water quality.

3.10.4 Mitigation Measures

Short-term impacts will be mitigated by Best Management Practices that will be identified specifically in the SWPPP of the General Construction Plan. Best Management Practices during construction will include silt fencing of the project site and temporary stormwater detention. It may also include other erosion control measures, such as hydraulic control structures and vehicle wash-down areas. At the completion of construction, reseeded for the restoration of disturbed area will be implemented.

The focus of long-term mitigation may potentially include:

- Controlling stormwater to minimize sediment, oils and grease transport
- Emergency capture of roadway spills

If the project study area stormwater is discharged to the Washington City stormwater facilities, long-term water quality mitigation measures will be incorporated into the City's plan for stormwater quality maintenance under the City's existing UPDES permit (Permit number UTR090012). However, if the proposed action's stormwater collection facilities are independent of the City's system, designs will need to incorporate detention facilities to minimize discharges of sediment, oils, and spills to Mill Creek. These facilities could include sediment sumps with baffled outlets. Once the proposed project is completed, it will be transferred to Washington City, and the City will need to incorporate the proposed project's stormwater facilities into its UPDES permit.

Because the bridge over Mill Creek is at the lowest elevation in the project study area, stormwater from the bridge will discharge directly to Mill Creek without detention. Catch basins on the bridge will incorporate limited sediment trapping and oil-water separation.

Mitigation measures during construction will include:

- Preparation of a SWPPP
- Construction of sediment pits
- Re-seeding of disturbed areas
- Coordination with the City based on information in the Washington City Stormwater Master Plan

Mitigation measure following construction will include:

- Sumps with elevated outlets to trap sediment, roadway spills, oils, and grease
- Bridge catch basins with limited sediment traps and oil-water separation

3.11 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by the Wild and Scenic Rivers Act of 1968. The act is the primary Federal regulation governing the treatment of certain selected rivers that possess remarkable scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values.

The only flowing water within the project study area is Mill Creek, which is not listed as a wild and scenic river. No further discussion of this topic will be necessary.

3.12 Wetlands

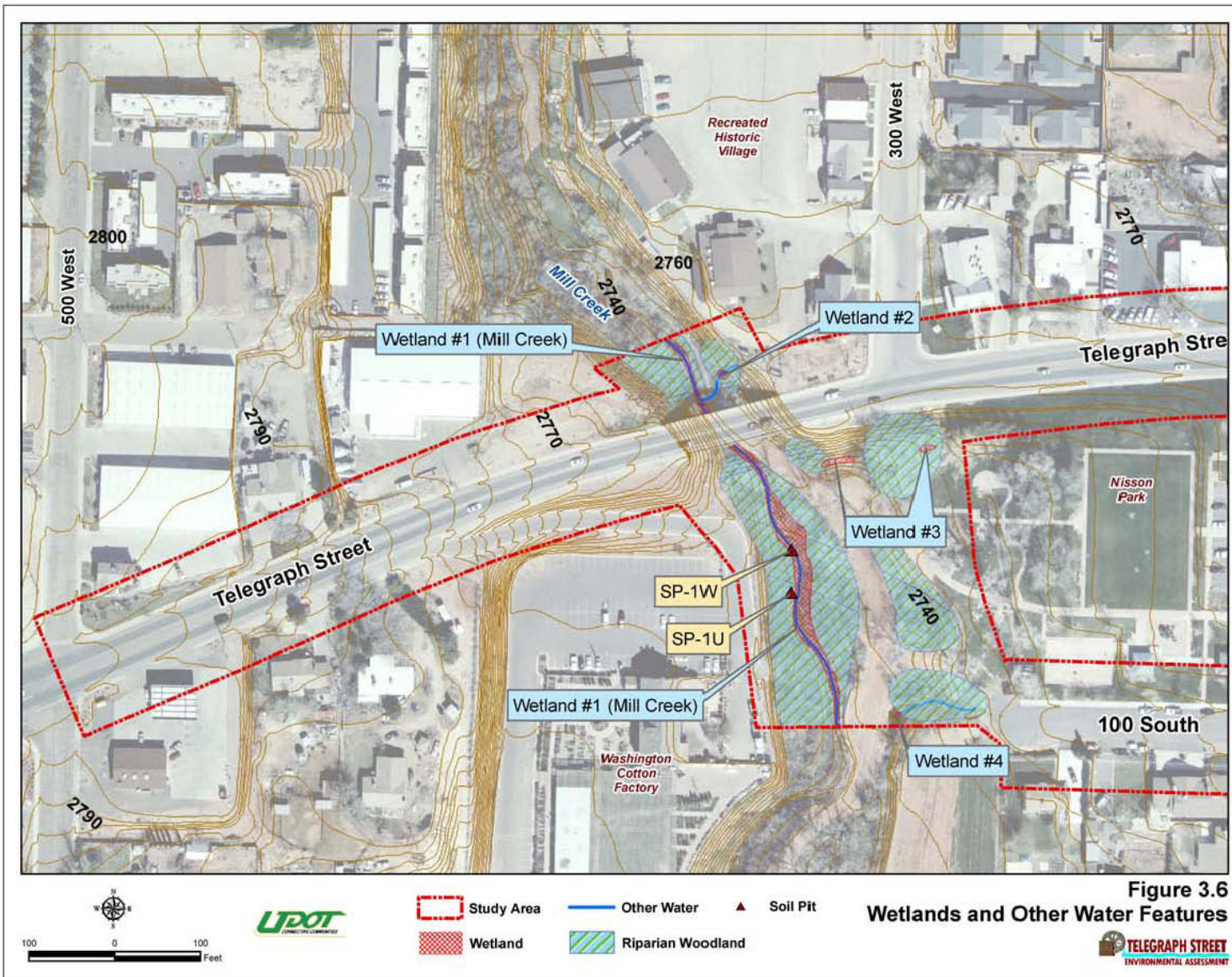
3.12.1 Regulatory Setting, Studies, and Coordination

Wetlands are important biological resources that perform many functions including groundwater recharge, flood flow attenuation, erosion control, and water quality improvement. They also provide habitat for multiple plants and animals, including special status species.

Wetlands are defined by the U.S. Army Corps of Engineers (Corps) and EPA based on the presence of wetland vegetation, wetland hydrology, and hydric soils. Many wetlands (and other aquatic features, including intermittent and perennial streams) are considered waters of the United States by the Corps, and these “jurisdictional” areas are protected under Section 404 of the Clean Water Act (CWA). The CWA requires that the Corps issue a permit for any discharge of dredged or fill material into such waters. Additionally, it should be noted that the CWA only “protects” those wetlands and other waters considered jurisdictional by the Corps, whereas it is UDOT’s policy to consider all wetlands and mitigate for all impacts to jurisdictional and non-jurisdictional wetlands.

The entire study area was walked and/or driven in June 2006 to identify wetlands and other water features. Wetlands were identified based on the presence of wetland vegetation, wetland hydrology, and hydric soils. Wetland functions were assessed for all wetlands using a modified version of the Montana Method (Berglund 1999). The method provides ratings for twelve functions and values. Preliminary jurisdictional status was assigned to the wetlands and other water features in the study area. This assignment was based on the site’s connectivity to a known jurisdictional waterway via a culvert or other obvious hydrological connection. This preliminary assessment is not authorized by the Corps and will require confirmation.

Four wetlands and three other water features were identified within the project study area, as shown in **Figure 3.6**. They can be placed into two groups: those associated with Mill Creek and those associated with drainage ditches. The following sections describe these wetlands and other water features and state whether the feature is likely to be considered jurisdictional or non-jurisdictional under Section 404 of the CWA.



3.12.2 Affected Environment

As seen in **Figure 3.6**, four wetlands, encompassing a total of 0.15 acres, were delineated in the study area. The wetlands fall into two groups: those associated with Mill Creek and those along drainage ditches. All wetlands are expected to be considered jurisdictional by the Corps due to their proximity and/or connectivity to Mill Creek, which is a tributary to the Virgin River.

3.12.2.1 Mill Creek Wetlands

The wetlands along Mill Creek account for 0.14 acres 1 of the 0.15 acres of wetlands in the project study area. The wetlands are classified as 40 percent palustrine emergent (PEM) and 60 percent palustrine scrub/shrub (PSS), according to Cowardin, et al. (1979). They consist of a generally narrow fringe along Mill Creek with some wider areas where the lower floodplain is less constricted. Most of the PSS wetlands are along the east creek bank, and the PEM wetlands are along the west side. The dominant vegetation observed in the wetlands is listed in **Table 3.13**.

Table 3.13 Dominant Vegetation for Wetlands in the Project Study Area

Common Name	Scientific Name	Mill Creek Wetlands	Drainage Ditch Wetlands
Yerba mansa	<i>Anemopsis californica</i>	X	
Mule's fat	<i>Baccharis glutinosa</i>	X	
Common spikerush	<i>Eleocharis palustris</i>	X	X
Spearmint	<i>Mentha spicata</i>		X
Watercress	<i>Nasturtium officinale</i>	X	
Annual rabbitsfoot grass	<i>Polypogon monspeliensis</i>	X	X
Common three-square	<i>Scirpus pungens</i>	X	X
Narrowleaf cattail	<i>Typha angustifolia</i>		X
Broadleaf cattail	<i>Typha latifolia</i>		X
Stickywilly	<i>Galium aperine</i>	X	

Source: URS 2006

Other non-dominant plant species observed in the Mill Creek wetlands include narrowleaf cattail, cocklebur (*Xanthium strumarium*), Baltic rush (*Juncus arcticus*), Bermuda grass (*Cynodon dactylon*), sandbar willow (*Salix exigua*), spearmint, curly dock (*Rumex crispus*), salt heliotrope (*Heliotropium curassavicum*), and meadow fescue (*Festuca pratensis*).

The PSS portions of the wetland are generally dominated by mule's fat with yerba mansa, three-square, and stickywilly. These areas are mostly within 0 to 16 inches (vertical) of the low-flow channel of Mill Creek and contain shrubs up to 12 feet tall. The PEM portions of the wetland are dominated by yerba mansa, three-square, watercress, and rabbitsfoot grass. These areas are generally very narrow and are located immediately adjacent to the low-flow channel of Mill Creek (within 12 vertical inches).

All of the wetlands are surrounded by either disturbed areas (due to the construction of a parking lot to the west and a multi-use trail on the east) or riparian woodland. The riparian woodland areas are mostly dominated by velvet ash (*Fraxinus velutina*), Russian olive (*Elaeagnus angustifolia*), tamarisk (*Tamarix ramosissima*), mule's fat, and Goodding's willow (*Salix goodingii*) with Bermuda grass, stickywilly, ripgut brome (*Bromus diandrus*), salt heliotrope, and various other grasses and forbs. Much of the wetland and riparian woodland areas contain "social trails," which are created by people walking along the creek or shortcutting nearby roads and/or trails.

3.12.2.2 Drainage Ditch Wetlands

The remaining 0.01 acres of wetlands in the study area are associated with three very small wetlands that receive water from stormwater runoff or irrigation overflow from Nisson Park. All of these wetlands are situated along drainage ditches or in topographic lows near Mill Creek. All of the wetlands are very small, classified as PEM, and connected to Mill Creek via culverts under the multi-use path.

The dominant vegetation observed in these wetlands is listed in **Table 3.13**. Other non-dominant species observed in the wetlands include Baltic rush, soft-stem bulrush (*Scirpus validus*), Bermuda grass, spearmint, and meadow fescue. Most of the wetlands are surrounded by stands of young Fremont's cottonwood (*Populus fremontii*), mule's fat, velvet ash, and Goodding's willow.

3.12.2.3 Wetland Functions

Wetlands have been determined to merit special concern due to their relative rarity in the region, their functional role in and as components of hydrologic systems, the unique and important wildlife habitat and forage value they offer, and their heritage value. To assist in evaluating the functions and values of wetlands within the study area, a modified version of the Montana Department of Transportation Wetland Functional Assessment (Montana) Method (Berglund 1999) was used to determine the functions and values of the wetlands within the study area. The Montana Method was used because it is a relatively efficient and concise method that is generally relevant to this region.

Table 3.14 summarizes the functional ratings given to each wetland. The ratings shown in the table represent the rating of the function or value as it relates to the health and vigor of the ecosystem in general. A high rating translates to a wetland function or value that is essential for the continued health of the ecosystem.

Table 3.14 Wetland Functions and Values¹

Wetland Function	Mill Creek Wetlands	Drainage Ditch Wetlands
Federally Listed Species Habitat	L	L
State-Listed Species Habitat	H	L
General Wildlife Habitat	M	L
General Fish Habitat	M	N/A
Flood Attenuation	M	N/A
Short- and Long-Term Water Storage	M	L
Sediment/Nutrient/Toxicant Removal and Retention	H	M
Sediment/Shoreline Stabilization	H	L
Production Export/Food Chain Support	H	L
Groundwater Discharge/Recharge	N/A	N/A
Uniqueness	M	L
Recreation/ Education Potential	H	L

¹Ratings based on a modified version of the Montana Method (Berglund 1999):

H = high, M = moderate, L = low, N/A = not applicable

Source: URS 2006

The wetlands along Mill Creek received high ratings for 5 of the 12 functions and values assessed (**Table 3.14**). These include high ratings for State-listed species habitat, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, production export/food chain support, and recreation/education potential. The wetland received high ratings for these functions mostly due to its perennial water source combined with structurally diverse and dense vegetation community.

The high rating for recreation/education potential was due to the proximity of Nisson Park and the multi-use trail. The high rating for State-listed species is due to the suspected presence of Arizona toad (*Bufo microscaphus*), western banded gecko (*Coleonyx variegatus*), western threadsnake (*Leptotyphlops humilis*), and desert sucker (*Catostomus clarki*). There is some suspected incidental use by Federally listed species at the site, including western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and southwestern willow flycatcher (*Empidonax traillii extimus*).

The drainage ditch wetlands received mostly low ratings, with a moderate rating for sediment/nutrient/ toxicant removal (**Table 3.14**). These low ratings are mostly due to the extremely small size of the wetlands, combined with the lack of vegetative structure and permanent water source. The moderate rating was a result of the wetlands receiving direct runoff from urban and landscaped sources that may contain excess sediments, nutrients, and/or toxicants.

3.12.3 Impacts

3.12.3.1 No Build Alternative

There will be no direct or indirect impacts to wetlands resulting from the No Build alternative.

3.12.3.2 Build Alternatives

Impacts to wetlands and other waters were assessed both quantitatively and qualitatively. They are discussed below in terms of permanent and temporary impacts.

Long-Term Impacts

Permanently impacted wetlands include those that would be destroyed or their function permanently altered as a result of the proposed action. These impacts can be direct or indirect.

Direct

Generally, direct impacts from the Build alternatives would be the result of earthwork, including cut and fill areas for the roadway, and the installation of concrete, riprap, or other materials. These impacts are quantifiable and are based on conceptual roadway design plans. This involves using an assumed highway configuration and disturbance limits (based on slope gradients) for each alternative. The limits of disturbance were derived by “overlaying” the assumed roadway configuration (including cut/fill areas and other earthwork) on the wetland maps. The results of this analysis are presented in **Table 3.15**, and the impacts specific to each of the alternatives are discussed in the description of the impacts for that alternative.

Table 3.15 Long-Term Direct Impacts to Wetlands by Alternative

Alternative	Impacts by Wetland Group			
	Mill Creek Wetlands (square feet)	Drainage Ditch Wetlands (square feet)	Total (square feet)	Total (Acres)
No Build	0	0	0	0
One	428	0	428	0.0098
One – Narrow	346	0	346	0.0079
Two	462	0	462	0.0106
Two – Narrow	390	0	390	0.0089
Three – Narrow (Preferred Alternative)	390	0	390	0.0089

Source: URS 2006

Indirect

Indirect permanent impacts to wetlands include sedimentation, erosion, noxious weed invasion, and the loss of vegetation due to shadowing from the bridge. Most of these impacts are generally not quantifiable and are common to all of the Build alternatives.

Impacts to wetlands from erosion would typically be most pronounced in those wetlands along the roadway edge where there is increased flow frequency, volume, and velocity due to the increase in impermeable surface in the immediate area. Sedimentation impacts would be most pronounced in areas that receive and retain/detain surface runoff for longer periods of time.

Although noxious weed invasions typically occur in areas of exposed soil with full or partial sun, some noxious weeds are known to invade well-vegetated areas. In general, construction activities can provide a long-term vector for noxious weed invasion by exposing large areas of soil and by transporting various kinds of materials that may contain weed seeds. Although there are few noxious weed species that regularly occur within wetland areas, some species, such as Johnson grass and Bermuda grass, are commonly found along the perimeter of wetlands. Additionally, areas of exposed soil in nearby non-wetlands could be invaded and could provide an additional seed source for an invasion in wetland locations.

The loss of wetland vegetation as a result of bridge shadowing is dependent on the orientation, height, and width of the bridge. The most pronounced loss of vegetation as a result of shadowing is from low, wide bridges oriented in an east-west direction. Although all of the proposed Build alternatives include a wider bridge over Mill Creek, the bridge would be in the same location as the existing bridge. Therefore, impacts from shading would be minimal.

Short-Term Impacts

Temporarily impacted wetlands include those that would experience temporary modification of functions but that would be returned to their pre-construction (or better) condition after construction. These impacts are common to all of the Build alternatives and are associated with construction activities, including removing vegetation, exposing soil (potentially resulting in sedimentation, erosion, and noxious weed invasion), constructing access roads, and placing of silt fence or other temporary erosion control structures. These impacts would be relatively minor and localized, and impacted areas would be restored to the original conditions (or better) after construction. All areas of temporary disturbance are presented in

Table 3.16 and were estimated by adding a 10-foot wide buffer to all areas of direct permanent disturbance.

Table 3.16 Temporary Impacts to Wetlands

Alternative	Impacts by Wetland Group			
	Mill Creek Wetlands (square feet)	Drainage Ditch Wetlands (square feet)	Total (square feet)	Total (Acres)
No Build	0	0	0	0
One	112	56	168	0.0039
One – Narrow	165	0	165	0.0038
Two	135	17	152	0.0035
Two – Narrow	161	0	161	0.0037
Three – Narrow (Preferred Alternative)	161	0	161	0.0037

Source: URS 2006

The nature of most of the indirect permanent impacts and temporary impacts are common to all of the Build alternatives and are discussed above. Direct permanent impacts specific to each of the alternatives are discussed below.

Alternative One

Alternative One would result in 428 square feet (sf) of permanent impacts to wetlands. All of this impact would be to wetlands along Mill Creek, and there would be no permanent impacts to wetlands associated with drainage ditches (**Table 3.15**). All of the permanent impacts would be a result of the placement of fill, concrete, and other materials for the widening of the existing bridge. Since the permanent impacts to the Mill Creek wetlands are so minimal, there is not likely to be any noticeable loss of wetland functions. Temporary impacts to wetlands as a result of this alternative would total approximately 168 sf, including 112 sf to wetlands associated with Mill Creek and 56 sf to wetlands along drainage ditches.

Based on this level of impact to wetlands, this alternative would require a Nationwide §404 Permit from the Corps prior to construction.

Alternative One – Narrow

Permanent impacts to wetlands for Alternative One – Narrow would be similar to, but slightly less than, those of Alternative One due to the reduced footprint. This alternative would impact approximately 346 sf of wetlands instead of 428 sf as in Alternative One. All of these impacts would be to wetlands along Mill Creek (**Table 3.15**). Temporary impacts to wetlands as a result of this alternative would total approximately 165 sf (all to wetlands associated with Mill Creek). Based on this level of impact to wetlands, this

alternative would also require a Nationwide §404 Permit from the Corps prior to construction.

Alternative Two

Permanent impacts to wetlands for Alternative Two would be similar to, but slightly more than, those of Alternative One. Due to the shift to the south, this alternative would impact approximately 462 sf of wetlands instead of 428 sf. All of these impacts would be to wetlands along Mill Creek (**Table 3.15**). Temporary impacts to wetlands as a result of this alternative would total approximately 152 sf, including 135 sf to wetlands associated with Mill Creek and 17 sf to wetlands along drainage ditches. Based on this level of impact to wetlands, this alternative would also require a Nationwide §404 Permit from the Corps prior to construction.

Alternative Two – Narrow

Permanent impacts to wetlands for Alternative Two – Narrow would be similar to, but slightly less than, those of Alternative Two. Due to the reduced footprint, this alternative would impact approximately 390 sf of wetlands instead of 462 sf. All of these impacts would be to wetlands along Mill Creek (**Table 3.15**). Temporary impacts to wetlands as a result of this alternative would total approximately 161 sf (all to wetlands associated with Mill Creek). Based on this level of impact to wetlands, this alternative would also require a Nationwide §404 Permit from the Corps prior to construction.

Alternative Three – Narrow (Preferred Alternative)

Permanent and temporary impacts to wetlands for Alternative Three – Narrow (Preferred Alternative) would be the same as Alternative Two – Narrow.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to wetlands.

3.12.3.3 Section 404 (b)(1) Guidelines Analysis

As previously discussed, based on the minimal anticipated adverse effects to jurisdictional wetlands, it is expected that each alternative would be permitted pursuant to one or more Nationwide Section 404 permits. For projects permitted under Nationwide permits, a project-specific 404(b)(1) analysis is not required, because the analysis is done in connection with adoption of the Nationwide permit itself (see 33 CFR 330.5 (b)(3) and 40 CFR 230.7). Accordingly, no Section 404(b)(1) analysis is required.

3.12.4 Mitigation Measures

3.12.4.1 Compensatory Mitigation

All impacted wetlands will be mitigated in accordance with current UDOT, FHWA, and Corps wetland mitigation policy and the conditions of the §404 Nationwide Permit. All mitigation plans will be developed in coordination with the Corps and other appropriate agencies during the §404 permitting process. A concurrence letter from the Corps was received on January 19, 2007, and is included in **Appendix B** (Wetland Delineation Report).

The wetlands impacted by any of the Build alternatives will likely be mitigated on-site at Mill Creek. Compensatory mitigation will include the enhancement of wetland functions along Mill Creek by implementing one or more of the following (as approved by the Corps, FHWA, UDOT, and other agencies):

- Planting native trees and shrubs
- Performing non-native species control/removal
- Restoring small wetland and/or riparian areas previously impacted
- Remove litter, broken concrete, car tires, etc. from Mill Creek

3.12.4.2 Construction Mitigation Measures

In addition to compensatory mitigation, the following mitigation measures will be employed to minimize adverse impacts to wetlands during project construction:

- Unnecessary temporary impacts will be avoided by fencing the limits of disturbance through wetland areas prior to construction.
- Best Management Practices will be used during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, brush barriers, check dams, erosion control blankets, filter strips, fiber roll, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels.
- No equipment staging or storage of construction materials will occur within 50 feet of wetlands or other water features.
- The use of chemicals – such as soil stabilizers, dust inhibitors, and fertilizers – within 50 feet of wetlands and other water features will be prohibited.
- Equipment will be refueled in designated contained areas at least 50 feet away from wetlands and other water features.

- Where practicable, work will be performed during low flows or dry periods; if flowing water is present, it will be diverted around active construction areas.
- Any wetland areas used for construction access will be covered with a layer of geotextile, straw, and soil prior to use.
- Any new or modified bridge over Mill Creek will be designed to prevent any direct discharge of stormwater runoff into the creek.
- All temporarily impacted wetlands will be restored to their preconstruction conditions.

3.12.5 Only Practicable Alternative Finding

Executive Order 11990, Protection of Wetlands, directs Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts to wetlands. In accordance with FHWA's Technical Advisory T6640.8A (Guidance for Preparing and Processing Environmental and 4(f) Documents), this section explains why there is no practical alternative to the proposed action and why the proposed action includes all practical measures to minimize harm to wetlands.

During the formulation and screening of alternatives (see Chapter 2), wetland avoidance and impact minimization was a consideration. Since all of the Build alternatives cross the Mill Creek floodplain, where wetlands are unavoidable, all of the Build alternatives would result in wetland impacts. These impacts were kept to the minimum practicable for each alternative, while recognizing the Purpose and Need of the proposed action.

Based on the above considerations, it is determined that there is no practicable Build alternative to the proposed actions and that the proposed action includes all practicable measures to minimize harm to wetlands.

3.13 Water Bodies

3.13.1 Regulatory Setting, Studies, and Coordination

Water bodies, or "other water features," include any feature that contains open water or a defined bed and banks and that does not meet the Corps definition of a wetland. There are no other specific regulations, studies, or coordination efforts for other water features that do not meet the Corps definition of a wetland.

3.13.2 Affected Environment

A total of three linear other water features (625 linear feet) were identified in the study area (**Figure 3.5**). These include Mill Creek and two drainage ditches (one on each side of the Telegraph Street Bridge) that drain into Mill Creek. These features are listed in **Table 3.17**, and discussed briefly in the text that follows.

Table 3.17 Summary of Other Water Features

Features	Length (Feet)
Mill Creek	468
North Drainage Ditch	66
South Drainage Ditch	91
Total	625

Source: URS 2006

3.13.2.1 Mill Creek

Mill Creek flows north to south, and the project study area includes approximately 468 feet of the creek. It has a mostly sandy channel that is approximately 4 feet wide and 12 to 14 inches deep. The banks of the channel contain wetlands throughout the study area, and woody debris was observed in much of the channel. The channel has vertical cut banks from 1 to 3 feet high and generally becomes more entrenched in the reach downstream of the Telegraph Street Bridge. Two tributaries (drainage ditches) were identified in the study area and are discussed below.

3.13.2.2 Drainage Ditches

The north drainage ditch is approximately 3 feet wide and 66 feet long. It is composed of mostly riprap and appears to carry stormwater and irrigation return flow from the area northeast of the study area. Some portions of the channel have been badly eroded (evident by a perched culvert), and based on the presence of erosion control fabric and silt fence, some restoration to the channel may have taken place within the last few years.

The south drainage ditch is approximately 3 feet wide and 91 feet long. Similar to the north drainage ditch, this ditch is also composed of riprap and appears to carry stormwater and irrigation return flows. It begins at a culvert at the west end of 100 South. Both drainage ditches carry water to and from the drainage ditch wetlands discussed earlier.

3.13.3 Impacts

3.13.3.1 No Build Alternative

There will be no direct or indirect impacts to other water bodies resulting from the No Build alternative.

3.13.3.2 Build Alternatives

Impacts to other water features were assessed both quantitatively and qualitatively; these impacts are discussed in terms of permanent and temporary impacts.

The permanent and temporary impact analysis methods for other water features are the same as those used for wetlands (see Section 3.12.3 Impacts to Wetlands). The results of the analysis are presented in

Table 3.18 and **Table 3.19**, and the permanent impacts specific to each of the alternatives are discussed in the description of the impacts for that alternative. There would be no permanent impacts to Mill Creek from any of the Build alternatives due to the installation of a bridge that will span the entire channel.

The temporary impacts analysis area to Mill Creek would include the entire work area below the new bridge, plus the 10-foot work area buffer.

Table 3.18 Direct Permanent Impacts to Other Water Features

Alternative	Impacts by Water Feature (linear feet)			
	Mill Creek ¹	North Drainage Ditch	South Drainage Ditch	Total
No Build	0	0	0	0
One	0	27	0	27
One – Narrow	0	23	0	23
Two	0	0	0	0
Two – Narrow	0	0	0	0
Three – Narrow (Preferred Alternative)	0	0	0	0

¹There will be no permanent impacts to Mill Creek since the entire channel will be spanned.

Source: URS 2006

Table 3.19 Temporary Impacts to Other Water Features

Alternative	Impacts by Water Feature (linear feet)			
	Mill Creek ¹	North Drainage Ditch	South Drainage Ditch	Total
No Build	0	0	0	0
One	77	13	0	90
One – Narrow	66	7	0	73
Two	78	22	0	100
Two – Narrow	68	0	0	68
Three – Narrow (Preferred Alternative)	68	0	0	68

¹Temporary impacts to Mill Creek include the entire work area below the new bridge, plus the 10-foot work area buffer.

Source: URS 2006

Alternative One

Alternative One would result in the permanent loss of 27 linear feet of other water features. All of the impacts would be to the North Drainage Ditch and would be the result of widening the existing road. A total of 90 linear feet of other water features, including 77 feet of Mill Creek and 13 feet of drainage ditches, would be temporarily impacted during construction.

Alternative One – Narrow

Permanent impacts to other water features for Alternative One – Narrow would be similar to, but slightly less than, those of Alternative One. Due to the reduced footprint, this alternative would result in the loss of 23 feet of the North Drainage Ditch. All of these impacts would be the result of widening the existing road. A total of 73 linear feet of other water features, including 66 feet of Mill Creek and 7 feet of drainage ditches, would be temporarily impacted during construction.

Alternative Two

There would be no permanent impacts to other water features as a result of this alternative. However, a total of 100 linear feet of other water features, including 78 feet of Mill Creek and 22 feet of drainage ditches, would be temporarily impacted during construction.

Alternative Two – Narrow

There would be no permanent impacts to other water features as a result of this alternative. However, a total of 68 linear feet of Mill Creek would be temporarily impacted during construction.

Alternative Three – Narrow (Preferred Alternative)

Impacts to other water features for Alternative Three - Narrow (Preferred Alternative) would be the same as Alternative Two – Narrow.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to water bodies.

3.13.4 Mitigation Measures

In order to minimize adverse impacts to other water features during construction, the mitigation measures listed for wetlands will be implemented (see Section 3.12.3 Wetland Impacts).

3.14 Wildlife

3.14.1 Regulatory Setting, Studies, and Coordination

Coordination with the USFWS is required on this proposed project to receive concurrence on the determination of the impacts and mitigation for each Threatened and Endangered (T&E) species.

Information on the biology, distribution, and listing history of each species was obtained from USFWS Federal Register documents, field guides, Utah Natural Heritage Program's (UNHP) Biodiversity Tracking and Conservation System (BIOTICS), and communication with field experts at UDWR.

A field visit was conducted during the summer of 2006 to identify habitat and any T&E species within the project study area.

The USFWS has been consulted to confirm mitigation requirements and has responded with a concurrence of Not Likely to Adversely Affect. Refer to **Appendix C** (Threatened and Endangered Species Coordination), for concurrence letter.

3.14.2 Affected Environment

This section discusses the wildlife known or potentially present in or near the study area. Information on species distribution was obtained from habitat assessments using aerial photography, information collected during a site visit, Utah Division of Wildlife Resources (UDWR) data, and other available literature.

3.14.2.1 Habitats

The project study area is located within the Lower Sonoran Life Zone within the Mojave Basin and Range Ecoregion (USEPA 2002). This ecoregion contains scattered mountains with natural vegetation commonly dominated by creosote bush (*Larrea tridentata*). The Lower Sonoran Life Zone is characterized by an annual precipitation average of 2 to 15 inches and annual mean temperatures between 51 and 74 degrees Fahrenheit.

Three general habitats occur in the project study area: disturbed areas, riparian woodland, and wetlands. Disturbed areas consist of landscaped areas, paved roads, parking lots, pedestrian trails, residential and commercial property, and vacant, weedy lots. The Mill Creek corridor is the most suitable habitat to support wildlife in the study area; however, much of the wetland and riparian woodland areas along Mill Creek contain “social trails” created by people walking along the creek or shortcutting nearby roads and/or trails. A landscaped recreational park is located to the east of Mill Creek, south of Telegraph Street.

The Mill Creek corridor contains riparian woodland, which is important to wildlife for food, cover, water, and as a migratory corridor. Various fish, amphibians, muskrats, and a variety of waterfowl utilize the open water of the creek. The riparian woodland areas are mostly dominated by velvet ash (*Fraxinus velutina*), Russian olive (*Elaeagnus angustifolia*), tamarisk (*Tamarix ramosissima*), mule’s fat (*Baccharis glutinosa*), and Goodding’s willow (*Salix goodingii*) with Bermuda grass (*Cynodon dactylon*), ripgut brome (*Bromus diandrus*), salt heliotrope (*Heliotropium curassavicum*), and various other grasses and forbs.

Wetlands, which also occur in association with Mill Creek, are transitional areas between the aquatic and upland terrestrial habitats where the water table is near the ground surface. All of the wetlands along Mill Creek are surrounded by either disturbed areas (due to the construction of a parking lot to the west and a multi-use trail on the east) or riparian woodland. Plant species in the wetlands associated with the creek are discussed in Section 3.12 – Wetlands. Common wildlife inhabiting wetlands include waterfowl and shorebirds, amphibians and reptiles, and mammals.

3.14.2.2 Wildlife Species

Based on the habitats present in the study area, numerous species of mammals, birds, reptiles and amphibians, and fish could occur at the site. The following section provides a brief description of those that were either observed during field visits or that are likely to occur.

Mammals

A variety of mammals that inhabit or depend on riparian habitats are known or likely to occur in the study area. These include bats, rodents, carnivores, and mule deer.

Riparian habitat is important for bats that forage over open water or glean insects from leaves of foliage or from bark. Bats that utilize riparian woodland habitats within urbanized areas are generally more tolerant of surrounding urban land use. Those species that may occur in the study area include (Adams 2003, UDWR 2006):

- Big brown bat (*Eptesicus fuscus*)
- Spotted bat (*Euderma maculatum*)

- Silver-haired bat (*Lasionycteris noctivagans*)
- Hoary bat (*Lasiurus cinereus*)
- California myotis (*Myotis californicus*)
- Big-freetailed bat (*Nyctinomops macrotis*)
- Yuma myotis (*Myotis yumanensis*)
- Eastern pipistrelle (*Pipistrellus subflavus*)
- Brazilian free-tailed bat (*Tadarida brasiliensis*)

The most common small mammal in North America is the deer mouse (*Peromyscus maniculatus*). It can be found in most native habitats, except heavily urbanized areas and wetlands; therefore, it may be scarce along Mill Creek. Two non-native rodent species, house mouse (*Mus musculus*) and Norway rat (*Rattus norvegicus*), are common in urban areas. Common muskrats (*Ondatra zibethicus*) are found in any aquatic habitat with a permanent water source. Beaver (*Castor canadensis*) occur in various habitats adjacent to water, and past evidence of beaver activity was observed in June 2006 site visits (including tree protection). Other rodent species likely to occur include Botta's pocket gopher (*Thomomys bottae planirostris*), little pocket mouse (*Perognathus longimembris virginis*), southern grasshopper mouse (*Onychomys longicaudus*), and montane meadow vole (*Microtus montanus rivularis*) (Durrant 1952, UDWR 2006).

Medium-sized mammal species known to inhabit the study area include carnivores such as coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), and striped skunk (*Mephitis mephitis*).

Mule deer (*Odocoileus hemionus*) are the most important game animal in Utah and are part of UDWR Wildlife Management Unit 29. They occur in most habitats in Utah, though primarily in areas with thick brush or trees. The only suitable habitat for mule deer in the project study area is along Mill Creek.

Birds

In the western U.S., riparian habitats are critical for breeding and migration stopovers for migratory birds. Riparian woodland habitats support the highest diversity of bird species in all life stages of any habitat. In Utah, 66 to 75 percent of all bird species use riparian habitats during some portion of their life history (Parrish et al. 2002). In spring and fall, riparian habitats support large numbers of migrants, such as flycatchers, thrushes, warblers, and sparrows. The riparian habitat at Mill Creek is the most important habitat for birds in the project study area and supports the largest numbers of species during spring and fall migration. Birds likely to occur include:

- American kestrel (*Falco sparverius*)
- Western screech owl (*Otus kennicottii*)

- Great horned owl (*Bubo virginianus*)
- Northern flicker (*Colaptes auratus*)
- Belted kingfisher (*Ceryle alcyon*)
- Western wood-pewee (*Contopus sordidulus*)
- House wren (*Troglodytes aedon*)
- Black-billed magpie (*Pica pica*)
- American robin (*Turdus migratorius*)
- Yellow warbler (*Dendroica petechia*)
- Blue grosbeak (*Guiraca caerulea*)
- Bullock's oriole (*Icterus bullockii*)
- Summer tanager (*Pirunga rubra cooperii*)

Utah Partners in Flight (PIF) is a national organization of professionals from State and Federal natural resources agencies, universities, and non-governmental organizations. Utah PIF has published an Avian Conservation Strategy that prioritizes bird species in Utah and their habitats, and determines which birds and habitats are most in need of immediate and continuing conservation efforts. They also set objectives for conservation (Parrish et al. 2002). Utah PIF Bird Priority Species that may occur in the study area along Mill Creek include: Abert's towhee (*Pipilo aberti*), Bell's vireo (*Vireo bellii*), black-throated gray warbler (*Dendroica nigrescens*), broad-tailed hummingbird (*Selasphorus platycercus*), and Lewis's woodpecker (*Melanerpes lewis*). These species occupy lowland riparian woodland for breeding habitat. Abert's towhee and Bell's vireo are riparian obligates for breeding and/or wintering activities in Utah (Parrish et al. 2002).

Swallow nests were observed in the drainpipes under Mill Creek Bridge and were likely cliff swallow (*Petrochelidon pyrrhonota*) and barn swallow (*Hirundo rustica*). Northern rough-wing swallow (*Stelgidopteryx serripennis*) is also likely to nest in the study area and prefers to nest in stream banks.

Wetland and marsh habitats provide good nesting and foraging habitat for some bird species, especially areas with well-developed or dense vegetative cover, such as willows, cattails, rushes, and sedges. Marshy wetland habitat supports many waterfowl, shorebirds, raptors, and songbirds during all seasons. Some of the most common species inhabiting wetland habitats include:

- Red-winged blackbird (*Agelaius phoeniceus*)
- Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
- Common yellowthroat (*Geothlypis trichas*)

- Song sparrow (*Melospiza melodia*)
- Brewer's blackbird (*Euphagus cyanocephalus*)
- Savannah sparrow (*Passerculus sandwichensis*)
- Great blue heron (*Ardea herodias*)

Open water supports waterfowl during winter and migration. A variety of waterfowl would occur in the Mill Creek riparian corridor during spring, fall, and winter. Mallard (*Anas platyrhynchos*) and Canada goose (*Branta canadensis*) are the most common nesters and may be present during summer.

Additionally, migratory birds may utilize urban areas for nesting in the study area. Common bird species in urban areas include American robin, northern flicker, black-capped chickadee (*Poecile atricapillus*), and house finch (*Carpodacus mexicanus*). Non-native bird species such as rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*) also are common in urban areas. Although species diversity is very low in urban areas, the species that do occur are typically there in high numbers (Parrish et al. 2002).

Reptiles and Amphibians

Northern leopard frog (*Rana pipiens*) and non-native American bullfrog (*Rana catesbeiana*) were observed at Mill Creek during the June 2006 site visit. Other species that may occur based on suitable habitat and range include Arizona toad (*Bufo microscaphus*), an introduced non-native population of Pacific treefrog (*Pseudacris regilla*), tiger salamander (*Ambystoma tigrinum*), and Woodhouse's toad (*Bufo woodhousii*) (UDWR 2006, Wheeler 2006).

Reptiles that may occur in the study area based on known range and habitats present include:

- Eastern racer (*Coluber constrictor*)
- Terrestrial garter snake (*Thamnophis elegans*)
- Glossy snake (*Arizona elegans*)
- Gopher snake (*Pituophis catenifer*)
- Snapping turtle (*Chelydra serpentina*)
- Spiny softshell (*Apalone spinifer*)

Fish

Fish occurring in Mill Creek are primarily non-native species. Fishes known to occur in Mill Creek within the vicinity of the study area include speckled dace (*Rhinichthys osculus*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and western mosquitofish (*Gambusia affinis*) (Wheeler 2006).

3.14.3 Impacts

This section addresses impacts to wildlife resulting from each alternative. Construction of any of the Build alternatives may impact wildlife through:

- Mortality
- Habitat loss
- Habitat fragmentation
- Displacement during construction

The nature of wildlife impacts is similar for all of the Build alternatives and is discussed below. Any alternative-specific impacts are discussed later under each alternative.

3.14.3.1 Mortality

Impacts to wildlife as a result of mortality could occur during construction activities or during the operation of the roadway and associated roadway features; it is largely limited to terrestrial species (including birds). Construction-related mortality is generally associated with equipment crushing individual animals during earthmoving and other related activities. This type of mortality is generally most pronounced for small mammals, reptiles, and amphibians, since they are generally less mobile than larger mammals and birds. However, the eggs and young of birds (including raptors) are particularly susceptible to mortality from nest destruction during the nesting season. Of particular concern are swallows that commonly nest on bridges and other man-made structures that may be impacted by the proposed action.

The mortality of wildlife during operation of the roadway is mostly associated with vehicle/wildlife collisions. Additional mortality of birds could be associated with roadway lighting. Migrating birds are attracted to light beams pointed upward or out, particularly during inclement weather conditions, and can become trapped in them. Once inside a beam of light, birds are reluctant to fly out of the lighted area into the dark, and often drop to the ground from exhaustion. An exhausted bird on the ground is vulnerable to predation and mortality from a collision with a vehicle (FLAP, 2004).

3.14.3.2 Habitat Loss

Since the wetland and riparian habitats are the only “natural” or relatively undisturbed areas present in the project study area, they are the only habitats included in the discussion of habitat loss. The other habitats in the project study area consist of developed lands that may provide marginal habitat for various species but are generally of low quality.

The loss of habitat can be temporary or permanent. The permanent loss of habitat would be the result of the installation of permanent roadway features, including the placement of fill, concrete, pavement, or other materials used in the construction or widening of the road. It would also result from the installation of other roadway features into both terrestrial and aquatic habitats. The acreage of natural habitats permanently impacted by the proposed action is presented in **Table 3.20**.

Table 3.20 Permanent Impacts to Wildlife Habitat by Alternative

Alternative	Impacts by Habitat Type (acres) ¹		
	Wetlands	Riparian Woodland	Total (acres)
No Build	0.00	0.00	0.00
One	0.01	0.04	0.05
One – Narrow	<0.01	0.02	0.03
Two	0.01	0.08	0.09
Two – Narrow	<0.01	0.05	0.06
Three – Narrow (Preferred Alternative)	<0.01	0.05	0.06

¹Only wetlands and riparian woodland were considered; other habitats in the project study area are generally disturbed and of low quality

Source: URS 2006

Temporary habitat loss includes those areas that are adjacent to the areas of permanent disturbance; these areas would primarily be used for access during construction. These areas were estimated by using a 10-foot wide buffer around all areas of permanent disturbance. Although the existing vegetation would be cleared in areas of terrestrial habitat, it would be restored after construction. Aquatic habitats could also be temporarily impacted during construction due to decreased water quality caused by sedimentation. The acreage of habitats temporarily impacted by each alternative is presented in **Table 3.21**.

Table 3.21 Temporary Impacts to Wildlife Habitat by Alternative

Alternative	Impacts by Habitat Type (acres) ¹		
	Wetlands	Riparian Woodland	Total (acres)
No Build	0.00	0.00	0.00
One	<0.01	0.04	0.05
One – Narrow	<0.01	0.05	0.06
Two	<0.01	0.05	0.06
Two – Narrow	<0.01	0.06	0.07
Three – Narrow (Preferred Alternative)	<0.01	0.06	0.07

¹Only wetlands and riparian woodland were considered; other habitats in the project study area are generally disturbed and of low quality

Source: URS 2006

3.14.3.3 Habitat Fragmentation

Impacts to wildlife from habitat fragmentation are associated with the destruction or modification of habitat, or with the introduction of a permanent disturbance into habitat that serves to divide large areas of continuous habitat (or movement corridors) into smaller disconnected areas. Although the habitats in the study area have already been somewhat fragmented due to the design of the existing Mill Creek Bridge, there is still an intact movement corridor along Mill Creek. Small and large mammals, birds, and reptiles and amphibians currently use this corridor. None of the alternatives would result in further fragmentation of the Mill Creek habitats.

3.14.3.4 Displacement

Impacts to wildlife from noise and associated visual disturbances could result in the temporary displacement of some species during construction and the permanent displacement of some species during roadway operation. These impacts are similar for all Build alternatives.

The intensity of noise impacts during construction would decrease with increased distance from the construction zone, and trees can provide some buffering capacity. High noise levels can cause behavioral and physiological reactions in wildlife that vary by species and individual (Knight and Gutzwiller, 1995). Noise impacts would be most pronounced in areas where new roads are being constructed (previously undisturbed areas). Because of the existing level of development in the study area, it is likely that most wildlife is habituated to some level of traffic- and human-related disturbance; therefore, overall displacement from noise would be minor.

Birds and raptors are especially vulnerable to disturbance during nesting. Sensitivity to a disturbance is dependent on the species as well as an individual's tolerance; generally,

however, an individual will temporarily flush from or permanently abandon a nest due to disturbance. Temporary absence from a nest could result in high nestling mortality from overheating, chilling, desiccation, or premature fledging. Most raptors return to the same nest site or territory for consecutive years but may not return to their nesting territory the following season if it was disturbed the previous year (Romin and Muck, 2002). No raptor nests were observed in or near the study area.

3.14.3.5 Alternative One

Alternative One is expected to result in minor permanent and temporary impacts to wildlife. The impacts are discussed in general terms above and in more detail below.

Mortality

The mortality of wildlife expected during construction and operation of Alternative One cannot be quantified, but based on the small size of the impact area would be minimal. Nesting birds, burrowing animals, and other less mobile species would be most susceptible.

Habitat Loss

This alternative would result in the permanent disturbance of 0.05 acres of “natural” habitat, including 0.01 acres of wetlands and 0.04 acres of riparian woodland (**Table 3.20**). Additionally, it would result in the temporary disturbance of less than 0.01 acres of wetlands and 0.04 acres of riparian habitat as a result of construction activities. All impacts would be the result of widening the existing road.

Habitat Fragmentation

No new habitat fragmentation is expected along the Mill Creek corridor as a result of the roadway widening.

Displacement

The displacement of wildlife associated with the widening of the existing roadway would be minimal since vehicular traffic is already present.

3.14.3.6 Alternative One – Narrow

The impacts to wildlife as a result of mortality, habitat fragmentation, and displacement are similar for Alternative One – Narrow as those discussed for Alternative One. The permanent habitat loss for this alternative would be slightly less than Alternative One, with the loss of 0.03 acres instead of 0.05 acres (**Table 3.20**). This includes the loss of less than 0.01 acres of wetland and 0.02 acres of riparian woodland. The temporary habitat impacts for this alternative would be slightly more than Alternative One, with less than 0.01 acres of wetland and 0.05 acres of riparian woodland. All impacts would be the result of widening the existing road.

3.14.3.7 Alternative Two

The impacts to wildlife as a result of mortality, habitat fragmentation, and displacement are similar for Alternative Two as those discussed for Alternative One. The permanent habitat loss for this alternative would be slightly more than Alternative One, with the loss of 0.09 acres instead of 0.05 acres (**Table 3.20**). This includes the loss of 0.01 acres of wetland and 0.08 acres of riparian woodland. The temporary habitat impacts for this alternative would be slightly more than Alternative One, with less than 0.01 acre of wetland and 0.05 acres of riparian woodland. All impacts would be the result of widening the existing road.

3.14.3.8 Alternative Two – Narrow

The impacts to wildlife as a result of mortality, habitat fragmentation, and displacement are similar for Alternative Two – Narrow as those discussed for Alternative One. The permanent habitat loss for this alternative would be slightly less than Alternative Two due to the reduced footprint width and would result in the loss of only 0.06 acres instead of 0.09 acres (**Table 3.20**). This includes the loss of less than 0.01 acres of wetland and 0.05 acres of riparian woodland. The temporary habitat impacts for this alternative would be slightly more than Alternative One, with less than 0.01 acres of wetland and 0.06 acres of riparian woodland. All impacts would be the result of widening the existing road.

3.14.3.9 Alternative Three – Narrow (Preferred Alternative)

The impacts to wildlife as a result of mortality, habitat loss, habitat fragmentation, and displacement are the same for Alternative Three – Narrow (Preferred Alternative) as those discussed for Alternative Two – Narrow.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to wildlife.

3.14.4 Mitigation Measures

The following mitigation measures will be implemented to minimize impacts to wildlife:

- A revegetation plan will be developed for areas that will be temporarily disturbed during construction. The plan will address selection of appropriate plant species, soil preparation, seeding rates, and seeding methods. The revegetation plan will be reviewed by the UDOT Landscape Architect and UDWR.

- All areas temporarily disturbed during construction will be seeded or planted with native grasses, forbs, shrubs, and trees per the revegetation plan. Seeding will occur in the appropriate season; temporary seeding or mulching may also be required. All areas to be reseeded will be disked or tilled prior to planting and/or seeding.
- Areas of riparian woodland removed for construction will be replaced or enhanced with an equivalent acreage. Habitat replacement or enhancement will consist of planting native trees and shrubs, controlling noxious weeds, or seeding of native species. Habitat enhancement will be accomplished within the study area, ideally along Mill Creek.
- Removal of riparian woodland vegetation will be avoided where possible. Removal of trees in areas of temporary disturbance will be minimized.
- During construction, vehicle operation will be restricted to the designated construction area, which will be fenced or clearly flagged. Construction limits will be fenced with silt-type fencing where adjacent to sensitive habitats, such as riparian woodland or wetland habitats.
- Noxious weeds will be controlled during construction and operation in compliance with State and County requirements and UDOT policy.
- Best Management Practices will be used during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, erosion control blankets, sandbag barriers, mulch and mulch tackifier, silt fences, and/or straw-bale barriers.

3.14.4.1 Mill Creek Bridge

The following mitigation measures will be implemented during the design and construction of the bridge to minimize impacts to wildlife:

- The bridge will be designed so that wildlife are provided adequate crossing space on each side of Mill Creek. Shrubs and grasses will be planted at the entrances and underneath the bridge, as appropriate, to provide small animals cover when entering or passing through the bridge.
- Bridge lighting will be placed so that birds will not become trapped in the beam.

3.14.4.2 Migratory Birds

The following mitigation measures will be implemented to minimize impacts to migratory birds:

- Tree and shrub removal will occur during the non-nesting season (August 1 to April 1).
- Removal of or construction on the existing bridge will be avoided between May 15 and July 31 as to not disturb swallow nests and young. If construction must occur during this period, existing nests must be removed prior to April 1 and:
 - A non-toxic sticky gel (provided by Bird-X) will be applied to prevent birds from nesting (remove gel residue upon completion of construction), or;
 - A plastic tarp will be suspended over areas used for nesting to deter swallows from nesting under bridges during construction, or;
 - A polyethylene netting of appropriate size to prevent swallows from accessing the nest sites will be installed (remove after construction is completed).

3.14.4.3 Nesting Raptors

Raptors respond differently to disturbance based on species, individual tolerance, nesting cycle, topography, and vegetative cover, as well as the type, frequency, and duration of disturbance (U.S. Fish and Wildlife Service, 2002). To minimize adverse impacts to nesting raptors in the study area:

- Raptor nest surveys will be conducted prior to construction activity if the construction activity would occur during the breeding/nesting season (April 1 to August 1). Surveys should consist of two observations. The first survey would occur in the beginning of the nesting season, before trees leaf out (between March 15 and April 15, depending on seasonal variations), to identify locations of existing or active raptor nests within or near the construction area. The second survey would be conducted after nesting has begun (generally May 15 to June 1) to determine which nests are actively used and by which species.
- If an active nest is found, the U.S. Fish and Wildlife Service (USFWS) and/or UDWR biologists will be consulted to determine specific no-work buffer distances and durations based on species and site characteristics.

3.15 Threatened and Endangered Species

3.15.1 Regulatory Setting, Studies, and Coordination

Threatened and endangered (T&E) species or “special status species” include Federal- and State-listed threatened, endangered, and candidate species, as well as UDWR-listed

species. Information on the biology, distribution, and listing history of each species was obtained from USFWS Federal Register documents, field guides, Utah Natural Heritage Program's (UNHP) Biodiversity Tracking and Conservation System (BIOTICS), and communication with field experts at UDWR.

Coordination with the USFWS is required on this proposed project to receive concurrence on the determination of the impacts and mitigation for each species.

A field visit was conducted during the summer of 2006 to identify any T&E species within the project study area.

3.15.2 Affected Environment

Fifty species are listed as special status in Washington County, Utah, including those listed as threatened or endangered under the Endangered Species Act (ESA), as well as Utah Species of Special Concern and species receiving special management in Utah. Utah species of special concern and species receiving special management in Utah are not protected under the ESA or Utah State laws but are still tracked by UNHP as rare or imperiled species.

Of the 50 species listed in the county, **Table 3.22** lists those with potential habitat in or near the study area. A more detailed description of each species known to occur or with potential to occur in the study area is included following the table. Those species included in the Federal and State lists for Washington County that are unlikely to or do not occur in the study area are not discussed further.

Table 3.22 Special Status Species Occurrence in the Telegraph Street Project Study Area

Common Name	Scientific Name	Status ¹	Habitat	Occurrence in Project Study Area
Birds				
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT	Breeding generally occurs within 2.5 miles of large lakes, reservoirs, and major rivers in which there are adequate prey, perching areas, and nesting sites.	Unlikely; no known roosting or nesting habitat in project study area.
California condor	<i>Gymnogyps californianus</i>	FE	Mountainous country at low and moderate elevations, especially rocky and brushy areas near cliffs. Colonies roost in snags, tall open-branched trees, or cliffs, often near important foraging grounds.	Unlikely; habitat not suitable; may occasionally fly over but no important resources in project study area.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	FE	Obligate riparian nester, especially in areas of dense willow.	Potentially present; suitable habitat though none detected during 1998 to 2001 surveys conducted by UDWR.

Common Name	Scientific Name	Status ¹	Habitat	Occurrence in Project Study Area
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	FC	Large tracts of cottonwood/willow riparian woodland with dense sub-canopies	Potentially present; suitable habitat though none detected during 1998 to 2001 surveys conducted by UDWR.
Ferruginous hawk	<i>Buteo regalis</i>	SPC	Nests in grassland or shrub areas with flat and rolling terrain. Winters in open farmlands, grasslands, and deserts with abundant small mammal prey.	Unlikely; recent records of occurrence in vicinity. However, not preferred habitat due to urban development. No suitable nesting habitat is present in the project study area.
Lewis's woodpecker	<i>Melanerpes lewis</i>	SPC	Primarily in ponderosa pine woodland but also in riparian woodland	Unlikely; suitable habitat but no known populations in Washington County.
Long-billed curlew	<i>Numenius americanus</i>	SPC	Short grass areas with bare ground	Unlikely; recent records of occurrence in vicinity, but no suitable habitat in project study area.
Mammals				
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	SPC	Riparian woodland and rocky scrubland; roosts in caves and rock crevices during the day.	Unlikely; may occur during foraging only.
Big free-tailed bat	<i>Nyctinomops macrotis</i>	SPC	Rocky and woodland habitats; roosts in caves, abandoned mines, buildings, and rock crevices. Has been captured in lowland riparian habitats.	Potentially present during foraging; rare in Utah but may be locally more common.
Fringed myotis	<i>Myotis thysanodes</i>	SPC	Variety of habitats, including mixed conifer, desert riparian, and pinyon-juniper in areas with rocky outcroppings, cliffs, and canyons. Inhabits caves, mines, and buildings, most often in desert and woodland areas.	Potentially present during foraging only.
Spotted bat	<i>Euderma maculatum</i>	SPC	Variety of habitats, ranging from deserts to forested mountains; they roost and hibernate in caves and rock crevices. Has been captured in lowland riparian in desert shrub community and occasionally found in or on buildings in urban areas.	Unlikely; though historic records of occurrence in area.
Western red bat	<i>Lasiurus blossevillei</i>	SPC	Forages in forested areas near water; daytime roosting usually occurs in trees. Reported in Utah from towns and cottonwood groves in lowland riparian areas.	Unlikely; Mill Creek is suitable foraging habitat but species very rare in Utah. Western red bat has not been recorded near the project study area since 1983.

Common Name	Scientific Name	Status ¹	Habitat	Occurrence in Project Study Area
Amphibians				
Arizona toad	<i>Bufo microscaphus</i>	SPC	Juniper-dominated habitats and low-elevation riparian habitat, generally in association with permanent or semi-permanent water bodies in streams, washes, irrigated croplands, reservoirs, and uplands adjacent to water.	Likely present; historic records of occurrence in project study area and suitable habitat is present.
Reptiles				
Western banded gecko	<i>Coleonyx variegatus</i>	SPC	Variety of habitat types	Potentially present; records of occurrence within 0.5 mile of project study area; suitable habitat.
Western threadsnake	<i>Leptotyphlops humilis</i>	SPC	Sandy areas, alluvial deposits, and other areas with loose soils. Records in Washington County from irrigated fields	Potentially present along Mill Creek or fields.
Fish				
Desert sucker	<i>Catostomus clarki</i>	SPC	Benthic (bottom dwelling) that occurs primarily in streams, where spawning occurs in riffles during the winter and spring.	Potentially present; records of occurrence within 0.5 mile. Occurs downstream in the Virgin River and may occasionally occur in Mill Creek.
Flannelmouth sucker	<i>Catostomus latipinnis</i>	CS	Prefer large rivers, where they are often found in deep pools of slow-flowing, low-gradient reaches.	Unlikely; occurs downstream in the Virgin River and may occasionally occur in Mill Creek, though the habitat in project study area is not considered suitable.
Virgin spinedace	<i>Lepidomeda mollispinis</i>	SPC	Occurs in both the main stem Virgin River and tributary reaches, particularly in areas with swift runs interspersed with shaded pools. Clear, slow-moving water of creeks and small streams, and are usually found in areas with abundant cover.	Unlikely; occurs downstream in the Virgin River and may occasionally occur in Mill Creek though the habitat in project study area is not considered suitable.
Invertebrates				
Desert springsnail	<i>Pyrgulopsis deserta</i>	SPC	Known from six springs in Washington County.	Potentially present; historical records of occurrence within 0.5 mile of project study area.

¹ FE = Federally listed as endangered under the Endangered Species Act.

FT = Federally listed as threatened under the Endangered Species Act.

FC = Federal candidate for listing under the Endangered Species Act.

SPC = State of Utah wildlife species of concern.

CS = Species receiving special management in Utah.

Sources: Utah Department of Natural Resources 2006 and URS 2006

As shown in **Table 3.22**, the following species potentially occur in the study area based on presence of suitable habitat and/or records of occurrence.

3.15.2.1 Southwestern Willow Flycatcher

Southwestern willow flycatchers are rare in Utah. The subspecies nests in dense riparian vegetation, typically consisting of stands of willows (*Salix* sp.) with a cottonwood (*Populus* sp.) gallery forest overstory. The subspecies rarely nests where non-native salt cedar (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*) trees are interspersed with native willows (McDonald et al. 1997). Previous surveys conducted in 1998 through 2001 did not locate nesting southwestern willow flycatchers along Mill Creek in the study area; however, nesting pairs occur downstream of the study area along the Virgin River, approximately 0.5 miles to the southeast (Day 2006). The riparian habitat along Mill Creek in the study area is suitable habitat during migration, and the subspecies could be present during migration stopovers between April and June or September through October.

3.15.2.2 Western Yellow-billed Cuckoo

In the desert southwest, yellow-billed cuckoos nest in open riparian woodlands with an understory of dense vegetation. They also occasionally nest in orchards and other riparian-associated woodlands. Willow, cottonwood, and mesquite (*Prosopis* sp.) are preferred nesting trees, but they will also utilize orchards (Wiggins 2005). The presence of non-native salt cedar has reduced habitat suitability for yellow-billed cuckoos in the west. Although few historical breeding records exist from Utah, recent survey efforts found low numbers of breeding pairs at scattered locations, at least in non-drought years (Wiggins 2005). No yellow-billed cuckoos were found at Mill Creek during 1998 through 2001 surveys conducted by UDWR (Day 2006). The riparian woodland at Mill Creek is suitable habitat for yellow-billed cuckoos and the species may occur during migration or nesting.

3.15.2.3 Big Free-tailed Bat

Populations of big free-tailed bat in Utah occur in scattered locations across the southern half of the state, with the majority of records from the Colorado Plateau and Mojave Desert regions in association with desert scrub and desert riparian habitat types. Salt cedar dominates the riparian habitat used by big free-tailed bats. Preferred roosts are crevices and cavities in cliff faces, but no information concerning locations of known roost sites is available for Utah (UDWR 2006). Big free-tailed bats may occur during foraging, but no roosting habitat is present in the study area.

3.15.2.4 Fringed Myotis

Fringed myotis occupy a variety of habitats, but the most common habitats for this bat are dry, open areas (grasslands and deserts) interspersed with oak, pinyon-juniper woodlands, or ponderosa pine forest with abundant snags and rocky outcroppings, cliffs, and canyons (Keinath 2004). In southern Utah, riparian habitats comprised 20 percent of captures (Adams 2003). Therefore, fringed myotis may occur in the Mill Creek corridor during foraging only.

3.15.2.5 Arizona Toad

In Utah, Arizona toads only occur in the southwestern portion of the state where the species inhabits streams, washes, irrigated cropland, reservoirs, and uplands adjacent to water. The toad is inactive in cold weather. Adults are primarily nocturnal and newly metamorphosed young are active during the day. Arizona toads lay eggs on bottoms of shallow, slow-moving streams. Mill Creek is suitable habitat for Arizona toad, and the species is likely to be present in the study area.

3.15.2.6 Western Banded Gecko

Western banded geckos occur in southwestern Washington County in desert scrub habitat and sandy flats and washes of the lower elevations of Zion's canyon lands. Because it is nocturnal and somewhat secretive, the species is rarely encountered. It may be more common in Utah than records indicate, but no data are available to suggest population size or trends. However, populations may be threatened by habitat loss associated with urban expansion and development that is pervasive in this region of the state. The species may occur in the Mill Creek area.

3.15.2.7 Western Threadsnake

The nocturnal western threadsnake burrows in moist, loose soil. Records of the species in Utah are only from Washington County. Western threadsnake may occur along the riparian habitat at Mill Creek or other areas with irrigated soil (Wheeler 2006).

3.15.2.8 Desert Sucker

Desert suckers occur in the main stem Virgin River and its tributaries in Washington County. Typical habitat is small to moderately large streams with pools and riffles. Young and small fish occupy riffle areas, while large adults inhabit pools during daytime and move to riffles and rapids at night in periods of high turbidity. This species may occur in Mill Creek.

3.15.2.9 Desert Springsnail

Known habitat requirements of desert springsnail are from springs. Several springs are located in the vicinity of Washington City. The current status of the species in the study area is unknown, though desert springsnail has potential to occur in Mill Creek.

3.15.3 Impacts

Potential impacts to special status species (including threatened or endangered species) as a result of implementation of the roadway improvements are discussed in this section. Impacts were assessed using the same methods described in Section 3.14.3 for those special status species potentially occurring in the study area (as described in Section 3.14.2). The individual species are discussed under the Build alternatives.

3.15.3.1 No Build Alternative

Under the No Build alternative, no direct or indirect impacts resulting from this proposed project would adversely affect special status species in the study area.

3.15.3.2 Build Alternatives

The direct and indirect impacts to special status species, discussed below for Alternative One, are the same for all of the Build alternatives.

As discussed in Section 3.14.2, Alternative One would result in the permanent disturbance (direct impact) of 0.01 acres of wetlands and 0.04 acres of riparian woodland. The following text summarizes the direct and indirect impacts to special status species as a result of implementing Alternative One.

Southwestern Willow Flycatcher and Western Yellow-Billed Cuckoo

The Mill Creek corridor contains suitable nesting and foraging habitat for the southwestern willow flycatcher and western yellow-billed cuckoo. There is a possibility that the birds could occur during the nesting season or during migration, and that the proposed action could cause a minor loss of habitat and displacement that could affect either or both species directly.

Big Free-Tailed Bat and Fringed Myotis

The Mill Creek corridor contains suitable foraging habitat for the big free-tailed bat and fringed myotis. Since bat foraging occurs in the evening or early morning hours, the proposed action is unlikely to have a direct adverse affect on either species.

Arizona Toad, Western Banded Gecko, and Western Threadsnake

The Mill Creek corridor contains suitable habitat for the Arizona toad, western banded gecko, and western threadsnake. There is the possibility that these species could be affected by direct mortality, displacement, and minor habitat loss; however, because of

their mobility, the relatively small area of impact, and remaining areas of useable habitat in adjacent areas, adverse impacts to their populations are unlikely.

Desert Sucker

The desert sucker is known to occur nearby in the Virgin River, and although the habitat is marginal in the study area, occurrence in Mill Creek is possible. Since the proposed project would not involve the placement of piers or other structures in Mill Creek, and Best Management Practices will be implemented during construction to minimize sedimentation, the sucker is unlikely to be adversely affected.

Desert Springsnail

Little is known about the distribution of the desert springsnail in southern Utah, and although it is only known from six springs in Washington County, it could occur along Mill Creek. However, due to the lack of actual springs in the impact area, as well as the relatively small area of riparian and wetland habitat directly impacted, the proposed action is unlikely to adversely affect the species.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to threatened and endangered species.

3.15.4 Mitigation Measures

In order to avoid and minimize impacts to special status species, the following mitigation measures will be implemented:

The USFWS has been consulted to confirm mitigation requirements and has responded with a concurrence of Not Likely to Adversely Affect. Refer to **Appendix C** (Threatened and Endangered Species Coordination), for concurrence letter.

3.15.4.1 Southwestern Willow Flycatcher and Western Yellow-Billed Cuckoo

- No vegetation will be cleared along Mill Creek between April 1 and October 31 unless presence/absence surveys are conducted for the southwestern willow flycatcher and western yellow-billed cuckoo.
- Areas of riparian and wetland habitat removed for construction will be replaced or enhanced at an equivalent acreage to compensate for the effects of habitat loss. Habitat replacement or enhancement will consist of planting of native trees and shrubs, controlling noxious weeds, or seeding native species in the vicinity of the project study area. Habitat enhancement will be accomplished within the study area, ideally along Mill Creek.

3.15.4.2 Arizona Toad, Western Banded Gecko, Western Threadsnae, and Desert Springsnail

- During construction, vehicle operation will be restricted to the designated construction area, which will be fenced or clearly flagged. Construction limits will be fenced with silt-type fencing where adjacent to sensitive habitats, such as riparian woodland or wetland habitats.
- If any toads are observed during construction, they will be removed (by hand) and placed along the Mill Creek corridor outside the work area.

3.15.4.3 Desert Sucker

- Best Management Practices will be used during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels.
- See other mitigation measures listed in Section 3.12.4 for wetland mitigation.

3.16 Invasive Species

3.16.1 Regulatory Setting, Studies, and Coordination

Pursuant to Executive Order 13112, the project must prevent the introduction of invasive species, including noxious weeds; most ground-disturbing activities typically leave the land vulnerable to these species. Per the Utah Noxious Weed Act, noxious weeds are defined as “any plant the commissioner determines to be especially injurious to public health, crops, livestock, land, or other property” (UDAS 2006).

There are no specific studies or coordination efforts associated with invasive species.

3.16.2 Affected Environment

Table 3.23 lists the weeds that are officially published as noxious for the State of Utah and Washington County and shows which were observed in the study area.

Table 3.23 State of Utah and Washington County Noxious Weeds¹

Common Name	Scientific Name	Species Observed
Quackgrass	<i>Agropyron repens</i>	X
Poison milkweed	<i>Asclepias subverticillata</i>	
Hoary cress	<i>Cardaria draba</i>	
Musk thistle	<i>Carduus nutans</i>	
Diffuse knapweed	<i>Centaurea diffusa</i>	
Spotted knapweed	<i>Centaurea maculosa</i>	
Russian knapweed	<i>Centaurea repens</i>	
Yellow starthistle	<i>Centaurea solstitialis</i>	
Squarrose knapweed	<i>Centaurea squarrosa</i>	
Canada thistle	<i>Cirsium arvense</i>	
Field bindweed	<i>Convolvulus arvensis</i>	X
Bermudagrass	<i>Cynodon dactylon</i>	X
Leafy spurge	<i>Euphorbia esula</i>	
Dyers woad	<i>Isatis tinctoria</i>	
Perennial pepperweed	<i>Lepidium latifolium</i>	
Purple loosestrife	<i>Lythrum salicaria</i>	
Scotch thistle	<i>Onopordum acanthium</i>	X
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	
Perennial sorghum	<i>Sorghum almum</i>	
Johnsongrass	<i>Sorghum halepense</i>	X
Medusahead	<i>Taeniatherum caput-medusae</i>	

¹Bermudagrass has been specifically omitted from consideration as a noxious weed in Washington County
Sources: Utah Department of Agriculture, 2003 and URS, 2006

Of the 21 species listed by the State and County, 5 species, including quackgrass, field bindweed, Bermuda grass, Scotch thistle, and Johnsongrass were observed in the study area (**Table 3.23**). All five species were observed on the Mill Creek floodplain, and all but quackgrass were observed in disturbed upland areas. Although Bermuda grass was observed and is listed as a Utah noxious weed, it has been specifically omitted by the State from consideration as a noxious weed in Washington County.

3.16.3 Impacts

3.16.3.1 No Build Alternative

There would be no direct or indirect impacts to invasive or noxious weed presence if the proposed project was not constructed.

3.16.3.2 Build Alternatives

Noxious weed invasions would most likely be an indirect impact of the proposed action for all Build alternatives. As discussed in Section 3.12.3, invasions typically occur when soil is left exposed in sunny or partially sunny areas. Several noxious weed species were observed in the study area (see **Table 3.23**), and further invasions of these species could be facilitated by roadway construction. Weed seeds can be inadvertently transported by equipment into areas that were not previously invaded; portions of the project study area that have exposed soil during construction are easily colonized by aggressive species.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant increase in, or impacts resulting from, the presence of invasive species.

3.16.4 Mitigation Measures

In order to minimize the spread of noxious weeds in the work area, the following mitigation measures will be implemented:

- All noxious weeds will be verified and located in the work area. If assistance is needed for identification, the County weed control supervisor or UDOT's region landscape architect will be contacted.
- All existing noxious weed populations will be treated 10 days before starting earthwork operations
- Noxious weed populations identified before and during construction will be controlled using pre-emergent, selective, and non-selective herbicides, as listed in UDOT Special Provision Section 02924S Invasive Weed Control.
- High-pressure water blasting or steam-cleaning methods will be used to clean all earthmoving construction equipment (scrapers, bulldozers, excavators, backhoes, trenchers) of dirt, mud, and seed residue before initially entering the project area.
- If borrow material is used for any part of the proposed project, the Contractor will certify that the material is free of noxious weeds. If the borrow is stockpiled, it will be stabilized and remain weed-free for the duration.
- Staging areas will not be allowed in weed-infested areas unless the staging area is pre-treated using integrated management.

3.17 Historical and Archeological Resources

3.17.1 Regulatory Setting, Studies, and Coordination

The National Historic Preservation Act (NHPA), as amended, sets forth national policy and procedures regarding “historic properties” – that is, regions, sites, buildings, structures and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of NHPA requires Federal agencies to consider the effects of their undertakings on such properties, following regulations issued by the Advisory Council on Historic Preservation (ACHP) (36 CFR 800).

Four criteria are used to evaluate the significance of properties – Criterion A through Criterion D. Under all the criteria, the quality of significance is considered present in sites that possess integrity of location, design, setting, material, workmanship, feeling, and association. However, quality of significance also serves to differentiate the criteria, as shown below.

- **Criterion A:** The quality of significance is present in sites that are associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B:** The quality of significance is present in sites that are associated with the lives of persons significant in our past.
- **Criterion C:** The quality of significance is present in sites that embody the distinctive characteristics of a type, period, or method of construction; that represent the work of a master; that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.
- **Criterion D:** The quality of significance is present in sites that have yielded, or may be likely to yield, information important in prehistory or history.

Two historic properties surveys were conducted within the project study area; they are described below in the Affected Environment section (Section 3.17.2).

Coordination with SHPO is required on any project that identifies historic or potentially historic properties within a project study area. Consultation has begun for this project and is still in progress.

3.17.2 Affected Environment

In accordance with Section 106, the project study area was surveyed for archaeological and architectural resources. Two cultural resource studies have been performed in the project study area. The first was conducted by SWCA Environmental Consultants in July 2004 and was a Cultural Resource Reconnaissance Archaeological Survey and Standard Reconnaissance Level Architectural Survey. This report included properties in the study area along Telegraph Street. The second was conducted by URS in April 2006 and was an Archeological and Selective Reconnaissance Architectural Survey for buildings and

areas along 100 South in the project study area. This study was included because of the development of Alternative Four. The second survey report combined the first survey with the second survey; please see **Appendix D** (Archaeological and Architectural Survey). The entire surveyed area will still be discussed even though Alternative Four was eliminated from further discussion. This section will combine the results from both surveys into one discussion.

Fieldwork for the SWCA survey was carried out on June 14, 2004. A search of the project, site, and preservation files of SHPO was undertaken prior to fieldwork, on June 9, 2004. All cultural resource work for the current EA was carried out under authority of Utah State Antiquities Annual Permit Number U-04-ST. At the direction of UDOT, no Antiquities project number was obtained for the cultural resources work, as no consultation with SHPO was undertaken during this phase of the project development.

For the URS fieldwork, an electronic copy of the architectural database for Washington City was obtained from the Utah Division of State History, Preservation Section, on March 2, 2006. A URS Cultural Resource Specialist reviewed this database prior to conducting the fieldwork. On April 12, 2006, URS conducted a selective reconnaissance of the project study area; he then reviewed records at the Washington County Assessor's office on April 13, 2006. Assessor's records were also reviewed via the Internet on March 3, 2006. An Antiquities project number (06-UI-06-0783) was obtained from SHPO for this report and fieldwork.

URS also conducted an intensive pedestrian archaeological survey within an area of vacant land where the proposed alignment would cross Mill Creek. This was accomplished by means of one archaeologist walking a series of parallel transects spaced 15 meters apart across the area. No sites were identified.

Reconnaissance level architectural surveys carry two implications. First, a selective survey, unlike a standard survey, does not require that every building in the study area be recorded. Instead, only buildings constructed during the historic period (i.e., 45 years or older) need to be recorded. Second, the survey involves only a visual evaluation of properties, not an assessment of associated historical events or individuals. The surveys were augmented with research of Washington County Assessor and Recorder's Office and SHPO to determine property ownership and year of construction. Research was also conducted at the Washington County Assessor's office in an effort to find records pertaining to modification of the properties.

The methodology for documenting the architectural properties in the study area consisted of the following procedures. Each residence was visited, and a reconnaissance survey form was completed for the property and black-and-white and color digital photographs of the main facade were taken. Evaluation of the historic significance of each building was based primarily on age (at least 45 years old) and integrity. Refer to Section 3.17.1 for a description of the National Register Criterion against which each property was evaluated. In addition to the National Register Criterion used, the surveys used the

additional evaluation criteria listed below to evaluate the properties. This additional criterion is described by SHPO in its Standard Operating Procedures for reconnaissance level surveys. The four choices available are:

- **A – Eligible/Significant:** built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations; individually eligible for National Register (NR) under Criterion C; also, buildings of known historical significance.
- **B – Eligible:** built within the historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as “A” buildings; more substantial alterations or additions than “A” buildings, though overall integrity is retained; eligible for NR as part of a potential historic district or primarily for historical, rather than architectural, reasons.
- **C – Not Eligible:** built during the historic period but has had major alterations.
- **D – Out-of-period:** constructed outside the historic period.

Table 3.24 is a summary of the architectural resources. The properties/buildings that were found to have a SHPO rating and eligibility of D/Out-of-Period are not included in the table.

Table 3.24 Architectural Resource Summary

Address	SHPO Rating ¹ / NRHP Evaluation	NR Criterion for Eligible Properties	Year Built	Style	Type
121 W 100 S	C/Not Eligible		1929	Post-World War II: Other	Other Residential
76 E 100 S	C/Not Eligible		1930	Bungalow	Bungalow
120 E 100 S	C/Not Eligible		1925	Victorian Eclectic	Foursquare
184 E 100 S	B/Eligible	C	1890 ²	Victorian Gothic	Central Passage
71 S Main	C/Not Eligible		1900	Classic: Other	Hall-Parlor
113 S Main	B/Eligible	C	1910	Vernacular	Hall-Parlor
385 W Telegraph	A/Listed	Listed	1866	Classical: Other	Factory
10 N 100 W	C/Not Eligible		1860	Classical: Vernacular	Hall-Parlor
8 N 300 W	B/Eligible	A	1870	Greek Revival Temple Form	Residence
10 E Telegraph	C/Not Eligible		1917; 1940	1-Part Block Commercial	Store
11 E Telegraph	A/Eligible (listed on the NR)	Listed	1906; 1922	Victorian Eclectic	School
28 E Telegraph	C/Not Eligible		1910	Bungalow	Bungalow
82 E Telegraph	A/Eligible	C	1910	Bungalow	Bungalow
95 E Telegraph	B/Eligible	A	1900	Early 20 th Century Victorian	Hall-Parlor
111 E Telegraph	C/Not Eligible		1935	1-Part Block Commercial	Commercial
127 E Telegraph	C/Not Eligible		1938	World War II Era	Cottage

Address	SHPO Rating ¹ / NRHP Evaluation	NR Criterion for Eligible Properties	Year Built	Style	Type
				Cottage	
196 E Telegraph	C/Not Eligible		1957	Post WWII	Restaurant
217 E Telegraph	C/Not Eligible		1880	Mix of Classical and Neo-Spanish	Hall-Parlor or crosswing
65 W Telegraph	B/Eligible	A	1880	Classical/ Vernacular and Colonial Revival	Residence
97 W Telegraph	A/Eligible (listed on the NR)	Listed	1872/19 04	Vernacular Greek Revival	Center- crosswing
214 W Telegraph	B/Eligible	A	1955	Post WWII	Business
258 W Telegraph	C/Not Eligible		1947	Post WWII	Ranch/ Rambler
375 W Telegraph (Bridge)	A/Eligible	C	1937	Art Modern	Bridge
409 W Telegraph	C/Not Eligible		1955	Late 20 th Century Post WWII	Residence

Sources: URS 2006 and SWCA 2004

¹Evaluation: A=Eligible/Significant and essentially unaltered, B=Eligible with some alterations, C=Not Eligible, lacks integrity.

²Year Built is estimated based on appearance; information was not available from assessor's records.

There are 13 properties that are Not Eligible and 11 Eligible properties. Three of the Eligible properties are currently listed on the NR. The figures in Chapter Two, showing the Build alternatives, also show the location of listed or eligible historic properties within the project study area.

3.17.3 Impacts

3.17.3.1 No Build Alternative

There would not be any direct or indirect impacts associated with the No Build alternative.

3.17.3.2 Build Alternatives

The following table (**Table 3.25**) lists all of the historic properties directly impacted, including the Mill Creek Bridge, by alternative and whether the direct impact is adverse or not adverse. It also indicates how many acres would be required from the property or if the property would be completely acquired by the proposed action. A more comprehensive discussion of all of the historic properties, which are also protected under Section 4(f), is included in Chapter Four.

Table 3.25 Historic Properties Impacted by Build Alternative

Address	Build Alternative and Effect (Acres)				
	One	One – Narrow	Two	Two – Narrow	Three – Narrow (Preferred Alternative)
385 W Telegraph	No Adverse (0.11)	No Adverse (0.07)	No Adverse (0.18)	No Adverse (0.14)	No Adverse (0.18)
8 N 300 W	No Adverse (0.06)	No Adverse (0.05)	No Adverse (0.04)	No Adverse (0.02)	No Adverse (0.03)
214 W Telegraph	Adverse (Total Acquisition)	Adverse (Total Acquisition)	Adverse (Total Acquisition)	No Adverse (0.07)	No Adverse (0.07)
97 W Telegraph	No Adverse (0.007)	No Effect	No Adverse (0.006)	No Effect	No Adverse (0.006)
65 W Telegraph	No Adverse (0.01)	No Adverse (0.001)	No Adverse (0.006)	No Effect	No Adverse (0.001)
11 E Telegraph	No Adverse (0.05)	No Adverse (0.02)	No Adverse (0.14)	No Adverse (0.11)	No Adverse (0.02)
82 E Telegraph	Adverse (Total Acquisition)	No Adverse (0.07)	No Adverse (0.01)	No Effect	No Adverse (0.06)
95 E Telegraph	No Adverse (0.03)	No Adverse (0.01)	Adverse (Total Acquisition)	Adverse (Total Acquisition)	No Adverse (0.03)
375 W Telegraph (Bridge)	Adverse (Total Acquisition)	Adverse (Total Acquisition)	Adverse (Total Acquisition)	Adverse (Total Acquisition)	Adverse (Total Acquisition)
Totals					
Total Adverse Effects	3 Adverse Effect	2 Adverse Effect	3 Adverse Effect	2 Adverse Effect	1 Adverse Effect
Total Acres Impacted, but Not Adversely Affected	0.27 Acres	0.22 Acres	0.38 Acres	0.34 Acres	0.39 Acres

The minor ROW acquisitions would not change the character of the historic properties directly impacted and thus would make this type of direct impact a non-adverse effect. In fact, many of the minor ROW acquisitions are being taken to put in better sidewalks and a park strip with trees and other landscaping. The sidewalks with a landscaped park strip may enhance the character of the properties.

A permanent indirect impact from the potential relocations of the sites requiring total acquisition is the loss of historic buildings or structures in the area. Washington City and the public would like to see as many historic buildings as possible remain in Historic Downtown.

As seen in **Table 3.25**, all of the Build alternatives would require some properties, including the bridge, to be completely relocated. Alternative One and Alternative Two would require the most potential relocations of historic structures and thus have the greatest adverse impact, whereas Alternative Three – Narrow (Preferred Alternative)

would require the fewest potential relocations (only the bridge) and would have the least adverse impact.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to historical and archeological resources.

3.17.4 Mitigation Measures

Mitigation measures for the impacts of the proposed Build alternatives have been determined in consultation with SHPO, Utah Heritage Foundation, Washington City, and other interested parties. The mitigation measures are detailed in a Memorandum of Agreement (MOA) that is signed by the FHWA, SHPO, UDOT, and Washington City. Mitigation measures will include;

- Preparing an Intensive Level Survey (ILS) for the Mill Creek Bridge,
- Photographing the Mill Creek Bridge to document the general arrangement and exterior details,
- Preparing and submitting one complete set of engineering drawings (as-built), if available. Submitting a copy of the proposed roadway and bridge cross sections,
- Designing the bridge aesthetics to be consistent with the historic theme for the surrounding area,
- FHWA/UDOT continuing consultation with SHPO and Washington City concerning bridge aesthetics
- Inviting SHPO and Washington City to participate in preliminary aesthetic design discussions and reviews for the replacement bridge,
- Submitting all materials to the Utah Division of State History, Preservation Section, to be placed on file.

The MOA is signed by all parties involved in the consultation process. A copy of the MOA is included in **Appendix D**.

Context Sensitive Solutions will be used in designing the new bridge over Mill Creek. UDOT and FHWA are sensitive to the issues involved with the construction of a new bridge to replace the historic Mill Creek Bridge.

During construction, if any previously unknown cultural resources are encountered, construction will cease, and materials will be evaluated in accordance with UDOT Standard Specification 01355, Part 1.13, Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites, Human Remains, or Migratory Avian Species.

3.18 Hazardous Waste

3.18.1 Regulatory Setting, Studies, and Coordination

An environmental records search was conducted and reviewed for the study area as part of the EA for this proposed action. The objective of the records search and review was to identify and describe recognized environmental conditions associated with the present and historical uses of the properties located within the project study area. A recognized environmental condition is defined in the American Society for Testing and Materials (ASTM) Practice E 1527-00 as follows:

The presence, or likely presence of, any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions termed de minimis are not recognized environmental conditions.

The analysis for this EA identified the following potential areas of concern within the study area (as shown in **Figure 3.7**):

- Three leaking underground storage tank (LUST) sites, two of which are closed
- Four underground storage tank (UST) sites, two of which are closed

3.18.2 Affected Environment

Three LUST sites were identified within the study area, as shown in **Table 3.26**. Petroleum contamination associated with these LUSTs was present in soil and/or groundwater at each location. Two of the sites have been remediated and closed in accordance with State of Utah regulations. The remaining site (Lust ID: LZA) has not yet been closed; however, it has been recently sampled and shown to be free of contamination. The site is being closed, but the process is not yet complete.

Table 3.26 LUST Sites within the Study Area that are Closed

Location Name	LUST ID	Address	Closure Type	Date Closed
EZ Shop (Old Town and Country)	KUZ	471 W Telegraph St.	Samples < Tier 1	8/29/2000
Washington Service	IUW	214 W Telegraph St.	Samples < Tier 1	4/9/2001
Washington Service	LZA	214 W Telegraph St.	N/A	N/A

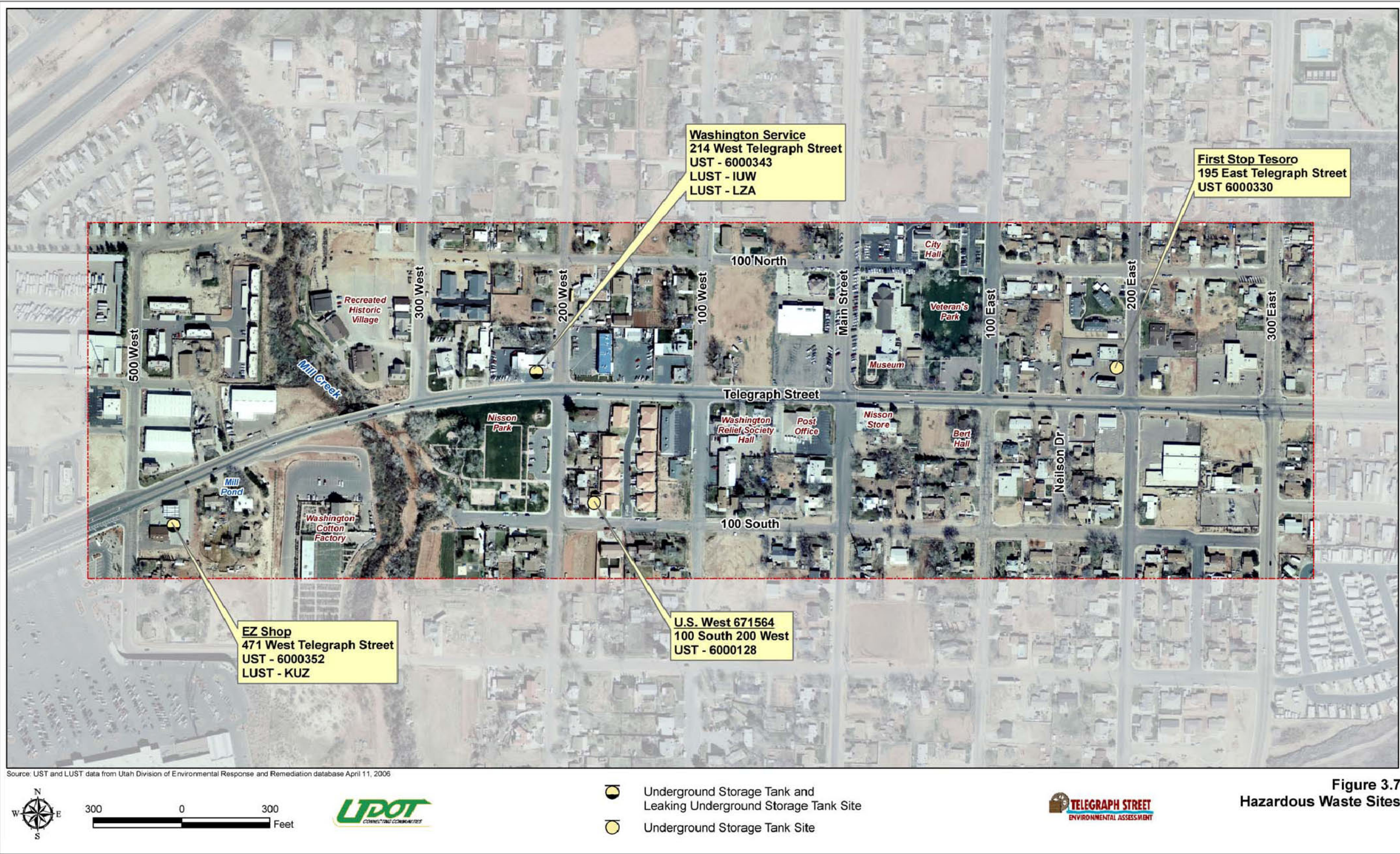
Source: Utah Department of Environmental Quality, Bureau of Solid and Hazardous Waste, Division of Environmental Response and Remediation 2006

Of the four UST sites identified within Telegraph Street study area, two sites have been closed in accordance with Utah State regulations. All four sites are listed in Table 3.27, below, and are shown on **Figure 3.7**. The condition of these tanks, and the presence or extent of any contamination associated with these tanks, is not known at this time. The possibility of encountering contamination during excavation activities in these areas is considered moderate.

Table 3.27 UST Sites within the Study Area

Location name	Facility ID	Address	Total Tanks	Closed Tanks
First Stop Tesoro	6000330	195 E Telegraph	3	0
EZ Shop (Old Town and Country)	6000352	471 W Telegraph	6	3
U.S. West 671564	6000128	100 S 200 W	1	1
Washington Service	6000343	214 W Telegraph	2	2

Source: Utah Department of Environmental Quality, Bureau of Solid and Hazardous Waste, Division of Environmental Response and Remediation 2006



3.18.3 Impacts

3.18.3.1 No Build Alternative

Under the No Build alternative, there would be no direct or indirect impacts to any of the sites listed above.

3.18.3.2 Build Alternatives

The possibility of encountering contamination exists at all of the sites except the U.S. West site, because it would not be disturbed by any of the Build alternatives. Below is a brief description of the direct impacts to hazardous sites by alternative.

Alternative One

This alternative would directly impact the Washington Service Center and the Old Town and Country sites, because both of these sites would be total acquisitions. (Potential relocations of businesses are discussed in Section 3.4.3.) Construction activities would involve avoiding, if possible, the USTs at the Old Town and Country site and at Washington Service. The gas pumps at the Old Town and Country are very close to the road and would likely need to be removed from the site during construction. There is also a recorded LUST at this site. There are also recorded LUST sites at Washington Service. Precautions would also be taken to avoid, if possible, any known contamination caused by the LUSTs. If contamination is encountered, the mitigation measures discussed in Section 3.18.4 would occur.

Because the road would be widened throughout the entire project study area, contamination could also be encountered at the First Stop if the UST has an unknown leak that is encountered during construction operations, such as digging the road base out.

It is possible that contamination would be encountered, and it could impact the construction schedule if the sites need to be cleaned up and cleared by the State.

Alternative One – Narrow

This alternative would require the complete acquisition/potential relocation of Washington Service, this would be a direct impact.

With this alternative, as with all of the Build alternatives, contamination could still be encountered at any of the sites located along Telegraph Street, because the road would be widened towards the underground tanks. There could be unknown leaking from USTs, and contamination from LUSTs might expand further than what is known.

Alternative Two

Alternative Two would require the potential relocation of the Washington Service Center and the Old Town and Country. Refer to the Alternative One discussion above for details.

Alternative Two would directly impact also First Stop by requiring the potential relocation of the business. Again, the pumps are located relatively close to Telegraph Street and would likely need to be removed. Any removal of pumps could increase the chance of contamination from removal. All precautions would be taken avoid creating any new contamination and to avoid any known contaminated area.

Alternative Two – Narrow

This alternative would require the potential relocation (direct impact) of the First Stop. Refer to the Alternative Two discussion above for impacts from this alternative.

Alternative Three – Narrow (Preferred Alternative)

This alternative would not require the potential relocation of any of the buildings associated with USTs or LUSTs. As with all of the other Build alternatives, underground tanks or contamination could be encountered during construction activities, because the road would be widened and would be closer to the tanks.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to hazardous waste.

3.18.4 Mitigation Measures

Before any construction begins, an accurate location for all of the USTs and LUSTs along Telegraph Street will be attained. By doing this, it would be clear whether or not special precautions need to be taken when building near any of these underground tanks.

If petroleum contamination was encountered during construction, mitigation will be in accordance with UDOT Standard Specification 01355, Environmental Protection, which directs the contractor to stop work and notify the project engineer of the discovery. Disposition of the hazardous material will take place under guidelines set by the Utah Department of Environmental Quality (UDEQ).

3.19 Visual Quality

3.19.1 Regulatory Setting, Studies, and Coordination

There are no specific FHWA regulations requiring the inclusion of a visual impact analysis in environmental documents. However, NEPA requires that considerations be given to determine the effects of proposed projects on the quality of the human environment. The visual quality is based on characterizing landscape quality, viewsheds, and viewer groups.

3.19.2 Affected Environment

Researchers have shown that the view from the road is the basis for much of what people know about the everyday environment of their city. It is also how they form their mental image of the landscape of the city and the surrounding area. Now, in addition to the view from the road, the view toward the road is also considered important to forming a mental image of the landscape and environment of the city.

Telegraph Street is a main thoroughfare through Washington City. In the proposed project study area, the road travels past Mill Creek and through the Historic Downtown area. A passenger or driver would see the creek, Nisson Park, and Veteran's Park and would also travel past a few historic buildings, namely the old Relief Society meeting hall and the Washington Museum. As Telegraph Street approaches Historic Downtown from the west, one would see a large shopping area with "big-box" type stores. The road is wider through this area. It is four lanes wide with a center turning lane. As the car approaches 500 West and Telegraph Street, the road becomes narrow, two-lanes wide, and has a center turning lane. The view from the car traveling from 500 West to 300 East along Telegraph Street is of many small businesses, a few historic buildings, and a few larger stores including Nisson's Food Town. There are some areas that appear to be "run down" and not in use.

As a pedestrian walking down Telegraph Street from 500 West to 300 East, one would see much more of the character of the area. A pedestrian would see the nature trail along Mill Creek, several historical buildings, and small businesses, such as beauty salons, insurance sales, and other specialty stores. A pedestrian could see the two parks along Telegraph Street and might notice that there are shaded areas to rest. If the pedestrian were to look towards the street, they would notice that traffic is fairly constant and heavy. There are large trucks that use Telegraph Street, because it is the main road through town. The cars and trucks are very close to the sidewalk and could be a distraction from the enjoyment of walking in the Historic Downtown area.

3.19.3 Impacts

3.19.3.1 No Build Alternative

The visual resources of the project study area would not be changed by the No Build alternative. Views and vistas would remain essentially as they are now, except for changes brought about by private development, an indirect impact.

3.19.3.2 Build Alternatives

All of the Build alternatives would result in a more visually prominent, widened roadway; this would be a direct impact on visual quality. The road would be compatible with the already widened portions of the corridor, as well as existing development in Washington City.

The widened roadway would not have any indirect impacts to visual resources in the corridor. However, the sidewalks with the landscaped park strip would create a visual barrier between drivers and pedestrians, possibly making the area seem less busy with traffic and more enjoyable to walk through or to gather in the parks.

Drivers, passengers, and pedestrians would most likely notice the increase in traffic volume because of the increased traffic capacity. The increased traffic could draw pedestrian's attention to the road instead of the shopping areas. However; there would be a landscaped parkstrip along much of the sidewalk within the proposed project area, which should provide a sort of block between the sidewalk and the street traffic. Because there will be landscaped medians this would give drivers and passengers a break between them and oncoming traffic, making the visual quality a little higher since they would not notice the oncoming traffic as much.

The bridge over Mill Creek would be replaced with all of the Build alternatives. The Mill Creek Trail passes under this bridge. It would be a visual impact to add a larger bridge over the creek and to have any sort of pipes or cables running under the bridge. The visual quality of the trail could be impaired if action is not taken to design a bridge that has visually appealing characteristics, such as architectural walls and something under the bridge that would cover any pipes or lines running under the bridge. This could be an opportunity to add art or interesting walls to the bridge crossing so that pedestrians and other trail users would have something more visually appealing to look at.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to visual quality.

3.19.4 Mitigation Measures

Principles of Context Sensitive Solutions have been examined to determine if special design considerations need to be evaluated to avoid visual impacts. Since Washington City desires the Historic Downtown area to be a pedestrian-oriented area, park strips with landscaping would be added between the sidewalk and the new widened road. This would reduce pedestrians' feeling of traveling on a major thoroughfare and would provide an aesthetically pleasing walkway to draw their attention away from traffic.

Other mitigation measures will include:

- Proper maintenance (coordinated by UDOT, Washington City, and the community) to avoid landscapes or structures becoming “eyesores” resulting from neglect
- Preservation of elements of Historic Downtown through context-sensitive design
- Architectural treatment considerations for the bridge and walls (i.e. form liners, stains, cut stone facades, etc.)

3.20 Energy

3.20.1 Regulatory Setting, Studies, and Coordination

There are no specific regulatory requirements regarding energy consumption or related mitigation for highway projects. Nor is there required coordination with any agency federal, state, or local agency.

3.20.2 Affected Environment

Energy is something that everyone is very concerned about in today's environment of growing energy costs. Within the project study area, Telegraph Street is not designed as an energy-efficient corridor. There are only two travel lanes and one middle turning lane along the section of road from 500 West to 300 East. As congestion grows in Washington City, cars could spend a longer time waiting in traffic through the Historic Downtown area. In fact, a new traffic signal was recently installed at the intersection of Telegraph and Main Street, and the cars are already backing up at this intersection along Telegraph Street. This means that people are in their cars longer and are wasting more energy in the form of gasoline or diesel fuel while they idle at the stoplight.

Telegraph Street is not designed for bicycle or pedestrian use. The shoulders are not very wide and, thus, not safe for bicycle traffic. The sidewalks are substandard and have some hazards (substandard pedestrian access ramps).

3.20.3 Impacts

3.20.3.1 No Build Alternative

Under the No Build alternative, there could be indirect impacts to energy. According to traffic modeling performed, vehicle traffic would increase along Telegraph Street with or without the proposed action. If traffic increases, congestion will increase without additional capacity to handle greater traffic volumes. The increased congestion would cause vehicles to be idle for longer periods of time along Telegraph Street within the project study area. The increase in idle time would create an increase in energy use of the vehicles. This would be a long-term impact, because the congestion would likely increase over time, and so energy use would also increase over time.

3.20.3.2 Build Alternatives

The Build alternatives proposed for this project would relieve congestion along Telegraph Street, improve the sidewalks, and provide a park strip. These improvements would make it easier and safer for pedestrians to use the corridor instead of driving.

The Build alternatives could indirectly create an environment where people would consume less fuels and thus less energy in the long term, because they would walk to their destinations along Telegraph Street in Historic Downtown. All of the Build alternatives discussed in Chapter Two would create a better flow of traffic and less idle time for cars. This would directly improve energy use. Because the Build alternatives are so similar, a quantitative comparison of energy consumption is not relevant.

All of the Build alternatives would likely not cause a net increase in energy consumption in the long term. The proposed action would involve some direct increases in energy consumption during the construction phase.

Based on the context and intensity of these impacts, and after mitigation, there will be no significant impacts to energy resources or consumption.

3.20.4 Mitigation Measures

The following list provides examples of the mitigation measures that will be followed to ensure that energy use will not be unreasonable:

- The primary contractor will be responsible to ensure that all construction equipment is properly tuned and maintained.
- Idle time will be minimized to 10 minutes or less, saving fuel and reducing emissions.
- Existing power sources will be used where possible.

3.21 Construction Impacts

This section provides an assessment of construction impacts and mitigation measures that may not have been discussed in great detail in the previous sections. It is not a complete listing of all of the construction impacts and mitigation measures from the previous section, but more of a brief description of some of the larger impacts from construction activities, and the mitigation measures associated with them. This section is organized differently in that each subsection lists impacts and mitigation measures together.

3.21.1 Travel Patterns and Accessibility

Long-term road closures will not be required for construction of any of the Build alternatives. However, Telegraph Street, over Mill Creek, would need to be temporarily closed during the construction of any of the Build alternatives, resulting in a short-term direct impact. Under all of the Build alternatives, the estimated closure time would be one entire construction season. This would create temporary traffic congestion in the area and an increase in traffic along alternative routes. Construction signs indicating access points and signs indicating that businesses are still open would be used to reduce direct construction impacts to businesses along the corridor.

3.21.2 Surface Water

During construction, direct impacts to water quality in Mill Creek are anticipated during construction due to sedimentation increases from stream bank disturbance. These disturbed areas may also cause an increase in suspended solids and nutrient loading from exposed areas. Construction activities may also introduce pollutants such as oil and grease from construction equipment. Implementation of temporary and permanent Best Management Practices would help mitigate any impacts to water quality from construction activities. The following actions would be implemented:

- Implementing a SWPPP that reduces sediment production and addresses all State and Federal requirements.
- Revegetating exposed soil to help minimize the establishment of non-native species to disturbed areas, along with constructing erosion and sediment control features such as fiber mats, catch basins, silt fences, and sediment barriers.
- Limiting work in the immediate vicinity of Mill Creek to periods of low flow to reduce water quality impacts.

3.21.3 Vegetation

Roadway construction activities would result in temporary direct and permanent direct impacts to vegetation. Some vegetation would be removed during cut-and-fill and other

construction activities, but most areas would be revegetated at the end of construction. Less than 5 acres would be temporarily disturbed. Provisions of UDOT Construction Special Provision 02924S, Invasive Weed Control, would be followed in order to prevent the introduction of invasive weed species into the job site. Provisions include cleaning equipment before entering the project study area, avoiding unnecessary disturbance of areas known to be infested with noxious weeds, and using herbicides where appropriate to control weeds.

3.21.4 Noise and Vibration

Construction noise impacts would occur but are considered temporary; they would be minimized by strict adherence to UDOT standard procedures for road construction (UDOT Specification 01355 Part 1.8). Construction work would be suspended if vibration levels exceed UDOT's specifications, and vibration monitoring may be instituted.

3.21.5 Hazardous Materials

The possibility of encountering contamination exists at all of the UST and LUST sites in the project study area. If petroleum contamination were encountered during construction, mitigation would be coordinated in accordance with UDOT Standard Specification 01355, Environmental Protection, which directs the contractor to stop work and notify the project engineer of the possible contamination. UDEQ would be consulted regarding the disposition of any hazardous material.

3.21.6 Utilities

Other than temporary access issues during construction activities, the proposed action would not directly impact the utilities along the corridor.

3.21.7 Air Quality

Construction activities could result in fugitive dust emissions within the project study area. The Utah Air Quality Rules require a dust control plan from all sources whose activities or equipment have the potential to produce fugitive dust or airborne dust. Dust control plans would be developed and implemented to minimize fugitive dust on-site from pits, yards, storage areas, and areas of operation and to prevent greater than 10 percent opacity from fugitive dust at within the project area.

3.22 Cumulative Effects

The Council on Environmental Quality (CEQ) defines cumulative impact as follows:

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

Because of the similarity of the Build alternatives for the proposed action, the cumulative impact analysis presented below applies to all of the Build alternatives.

3.22.1 Geographic Scope and Time Frame

Unless specifically described under the elements of the environment below, the geographic area for the cumulative impact analysis is bounded by I-15 to the north, the Washington City corporate boundary and Mill Creek Parkway to the west, Washington Parkway to the east, and the Virgin River to the south. This study area was determined to be appropriate because it contains the original downtown core and adjacent neighborhoods of Washington City.

From 1970 to the present, Washington City experienced substantial growth in population and new development. Accordingly, the analysis will consider growth and development trends during this 36-year period for past actions that may have had cumulative impacts. The time frame for reasonably foreseeable future actions is 20 years, which corresponds to the planning horizons for the Washington City Transportation Master Plan and the General Plan.

3.22.2 Past Projects

Previous development in Washington City and the surrounding area include a number of larger projects, such as residential communities, commercial/retail developments, and new roads. The most recent major action was the Washington Parkway from Telegraph Street north to I-15 at the MP 13 interchange, completed in 2006. It provides a new four-lane roadway to and from I-15. The full impact of the Washington Parkway has not yet been measured. However, it is expected to provide an alternative route for commuters now using Telegraph Street, enabling them to bypass the most congested part of downtown Washington City.

Other recent development within the study area includes two new fire stations on Buena Vista Boulevard and Washington Dam Road, and the Willard O. Nisson Park, completed in May 1999, on Telegraph Street east of Mill Creek.

3.22.3 Current Projects

The most notable current development activity in the Washington City area is the regional shopping area located just west of the project study area on Telegraph Street at the MP 10/I-15 interchange. Construction has been ongoing for 2 years and is still in progress. Several “big box” stores are located in the area, including Wal-Mart, Home Depot, and Best Buy, along with other retail uses such as Bed Bath and Beyond and Albertson’s. There are also small local retail shops as well as family and fast food restaurants. Within this regional shopping area, Telegraph Street is already a four-lane road with a center turning lane.

3.22.4 Reasonably Foreseeable Future Projects

In accordance with CEQ guidance, this analysis also assesses the following reasonably foreseeable activities that could result in cumulative impacts:

- 2006 and 2007 Statewide Transportation Improvement Program (STIP)

Two STIP projects are proposed within the cumulative impacts analysis area. The first project is 300 East from Telegraph Street to the Virgin River, which is in the Transportation Master Plan as a recommended 5-year transportation improvement project. The second project is the Washington Parkway Extension from Telegraph Street to Washington Dam Road, which is part of the long-range plan within the Washington Transportation Master Plan. These projects are discussed in greater detail in Section 2.9.

- 2005 Washington City General Plan

The General Plan represents a long-range vision for future growth and development in Washington City. By seeing where the community is now and where the community would like to be, Washington City can take actions that will develop the community and achieve the Plan’s vision. The General Plan is a valuable guide to the many decisions that need to be made to upgrade the community and to lay the groundwork for the long-range vision. During its 20-year planning horizon, the General Plan will be regularly updated to reflect new growth and development trends. Although the General Plan itself is not a regulatory document, many communities require that all zoning decisions – as well as decisions about new streets, parks, public buildings and utilities – be in conformance with the General Plan.

- Washington City and County Parks and Recreation plans within the Washington City General Plan.

According to the General Plan, there are seven planned parks within the city. These parks are not mapped in the General Plan. They include:

- Pine View Park
- Green Spring Park
- Virgin River Soccer Fields
- The Boilers Park
- Overlook Park
- Mill Creek Gorge
- Quail Ridge Park

The General Plan does not list specific dates for the construction of the parks; however, construction is considered to be likely within the 20-year planning horizon. In addition to the 7 planned parks, the General Plan shows the approximate location of 17 proposed parks, all of which are outside of the study area.

Washington City has designated three major trail corridors: the Virgin River and Mill Creek as pedestrian trails; the Washington/St. George Canal as a regional equestrian trail. Sections of the Virgin River and Mill Creek trails have already been completed, and more sections will be completed in the future. Work on the Canal trail has not yet begun.

- **Approved or Pending Development**

A number of actions are either in the permit application review process or are approved for construction (see **Figure 3.8**). A major regional commercial center is proposed at MP 13 on I-15, and the land just east of Washington Parkway, at approximately MP 13, is approved for additional residential and civic development, including an elementary school. The development to the east of Washington Parkway is just outside of the boundaries specified for the cumulative analysis. However, because it is located in approximately the same area as the MP 13 commercial/retail development, it is worth mentioning in the cumulative analysis. This development could increase traffic along Telegraph Street, and it could draw traffic from the South Fields (south of Virgin River) through the 300 East/Telegraph Street intersection to the new commercial/retail development at MP 13.

3.22.5 Cumulative Effects

The evaluation of potential cumulative impacts resulting from the proposed action was conducted for the following resources.

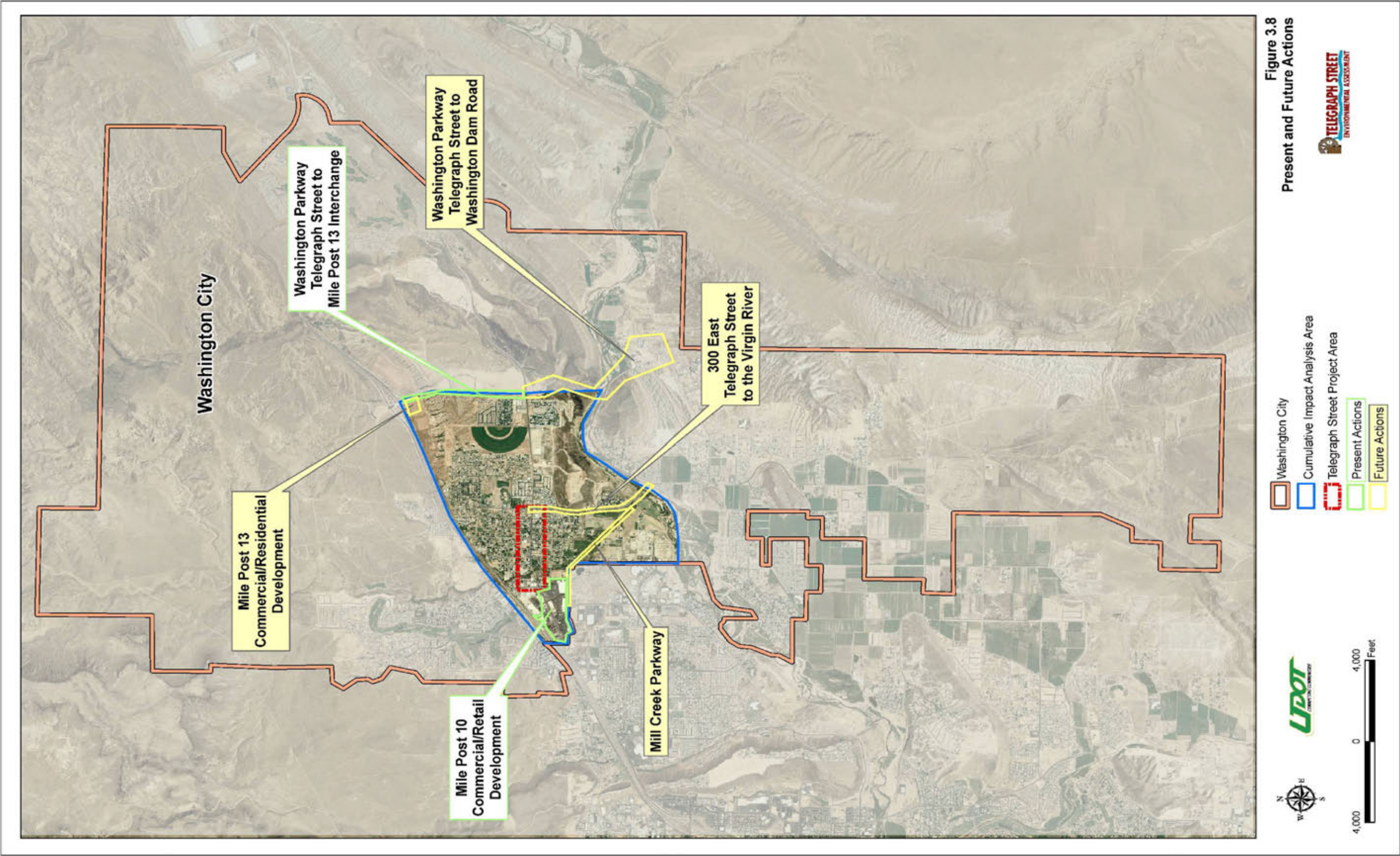
3.22.5.1 Land Use

The regulatory setting and existing conditions for land use are described in Section 3.1. Washington City was historically a small farming community that expanded rapidly beginning with widespread development in Washington County during the late 1970s. Since 1990, the Washington County region and Washington City have experienced rapid growth.

The proposed action will contribute to the pace of redevelopment in the downtown area by providing improved access and greater visibility for businesses. This redevelopment would be consistent with the General Plan.

Within the study area, previous development, together with the recent growth in the area, has resulted in increased secondary development (commercial, service and other business uses). Continuing development at MP 10 and 13 on I-15, construction of the Washington Parkway Extension, and completion of the Mill Creek Parkway (see **Figure 3.8**) will further contribute to induced growth. Characteristics of induced growth typically include conversion of agricultural or vacant land to low-intensity residential or commercial uses or of low-intensity uses to higher intensity/density uses. Proximity to the highway and increased accessibility to existing properties or uses can influence the rate of land conversion.

Given the context of rapid growth and development in the surrounding area and relatively low intensity of the planned improvements, the proposed action, combined with the impacts of past, present, and reasonably foreseeable future actions, is expected to have a low adverse cumulative effect on land use.



3.22.5.2 Social Impacts

The study area for social issues is the corporate limits of Washington City. The regulatory setting and existing conditions for social issues are described in Section 3.3.

Washington City is composed of many smaller communities. The city is somewhat split by features that tend to separate those communities. The two primary features that define these communities are I-15, which divides the city into northern and southern portions, and the Virgin River, which divides the southern portion of the city into north and south areas. The construction of the regional retail area at MP 10 and the future construction of a commercial and retail development at MP 13 will provide places that all of the communities within the city would use. Additionally, by improving existing roads and building new roads – such as the Mill Creek Parkway and the extension of Washington Parkway south from Telegraph Street – travel to and from these smaller neighborhoods that, at one time, seemed separated from one another, will be made easier.

Within the study area, two large parks along Telegraph Street (Nisson Park and Veteran's Park) serve as meeting places for several communities. There are also plans to build seven more parks within Washington City that will likely serve as community gathering places and venues for sporting activities and other events. With the construction of new parks and shopping areas to bring communities together, the past, current, and future actions would cause a beneficial cumulative effect.

Under all of the Build alternatives for the Telegraph Street project, there would be potential relocations. It is not known whether any of the new developments, including transportation projects, would require more potential relocations of businesses or residences. Several of the future foreseeable projects planned for Washington City are residential and commercial. Because of an abundant supply of vacant land available within the city, businesses and residences affected by current and future activities should be able to relocate within Washington City relatively close to their current locations. These actions from the Build alternatives are expected to have a low adverse cumulative effect on the community.

The Telegraph Street project would not create any new facilities or services. Utilities may be upgraded as a result of the proposed action, but those upgrades would not be part of the proposed project. Two new fire stations have been built in Washington City, and an elementary school is planned in the MP 13 area. A new water treatment plant was also constructed near Coral Canyon, to the northeast of the project study area. As development continues, it is likely that services, utilities, and public facilities in Washington City will need to be upgraded or added.

Because the city is still growing at a fast pace, public facilities, services, and utilities may not be able to handle the increase in use, or they may experience longer response times until more services or facilities are added. The cumulative effect of all of the past,

present, and reasonably foreseeable future activities on public facilities, services, and utilities within Washington City is expected to be moderate and adverse.

Veteran's Park and Nisson Park are already in use, and the Mill Creek and Virgin River trails are either under construction or in use. Additionally, a trail is planned along the Washington City/St. George Canal for equestrian use. The Telegraph Street project would only have a temporary impact to the Mill Creek Trail when the bridge over Mill Creek is reconstructed. The proposed action would have a permanent impact on Nisson Park by removing a small portion of the north side of the park for road ROW; however, park facilities would not be affected. The impacts to Veteran's Park vary by Build alternative and are discussed in Section 3.3.4.

The past, current, and future activities within the study area may have temporary impacts to recreational resources. It is unlikely, however, that they would have any permanent long-term negative impacts. The construction of new trails and parks in the next 20 years would likely increase the recreational opportunities within the city. Overall, the cumulative effects on recreational resources are expected to be beneficial.

3.22.5.3 Economic Conditions

The study area for economic conditions is the Washington City corporate boundary. Refer to Section 3.4 for a discussion of the regulatory setting and existing economic conditions in the project study area.

The significant economic growth that Washington City has experienced in the last 20 years is anticipated to continue. It is likely that as new retail and commercial developments are constructed, there will be more employment and business opportunities within Washington City. As business growth continues, the economic growth of Washington City will also continue. As opportunities increase within Washington City for new employment and businesses, more families will move to the area. It is likely that as the demand for housing in Washington City increases, the cost of homes will also increase. An increase in the cost of homes would generate an increase in taxes paid to Washington County and Washington City. The influx of new residents and businesses to the area would also increase the tax base for both the County and City. In conjunction with other past, present, and future activities in Washington City, the proposed action is expected to have a beneficial cumulative effect on economic conditions in the city.

3.22.5.4 Air Quality

Washington County is designated by the EPA as an attainment area for all NAAQS. Section 3.6 contains a discussion of the regulatory setting for air quality and existing conditions in the project study area.

Constraints of the existing roadway network and the predicted rate of growth place a burden on Washington City and the State of Utah to maintain an adequate transportation

system within the study area. Transportation plans, such as the Washington City Transportation Master Plan and the STIP, have been developed and are routinely updated to address these and other regional concerns. The proposed action is part of the STIP and, when analyzed regionally with other proposed transportation projects, conforms to control strategies and emission levels outlined in the STIP.

The significant pace of population and economic growth in Washington County is expected to continue during the 20-year planning horizon. In this time frame, the proposed action is expected to ease traffic congestion in downtown Washington City with a resulting beneficial effect on local air quality. In conjunction with other past, present, and future development in Washington County, the proposed action is expected to have a low adverse cumulative effect on regional air quality.

3.22.5.5 Noise

The study area for noise impacts includes the project study area along Telegraph Street from 500 West to 300 East. This study area was determined to be adequate, because it would not be feasible to assess ambient and background noise outside of the corridor without intensive noise monitoring and modeling. Section 3.7 contains a discussion of the regulatory setting and existing conditions for noise along Telegraph Street within the project study area.

Noise levels depend on a variety of inputs. Along streets, the noise level generally depends on the traffic volume and the types and speeds of the vehicles. Two future projects within the study area could increase noise levels on Telegraph Street. They include the planned extension of the Washington Parkway and the 300 East project, both of which would extend south from Telegraph Street. These projects have the potential to increase noise levels along Telegraph Street due to higher traffic volumes. Those volumes are not expected to be significant, as other traffic improvements will likely relieve some of the existing congestion along Telegraph Street. In conjunction with other past, present, and future development on or near Telegraph Street within the project study area, the proposed action is expected to have a moderate adverse cumulative effect on noise.

3.22.5.6 Floodplains

The study area for floodplains is the Mill Creek watershed (refer to **Figure 3.5**). Section 3.9 describes the regulatory setting and the existing conditions for floodplains within the project study area.

As recent events in Washington County have shown, encroachment of new development into floodplains can have very severe consequences. Policies in the General Plan call for development in the floodplain to be limited to uses such as open space, parks, golf courses, and trails. The General Plan also calls for new development within flood hazard

zones to provide adequate documentation to the City that it will not increase flood impacts to downstream or upstream properties.

There are no known developments of commercial, retail, or residential areas within the floodplain of the Mill Creek watershed. Based on the policies and regulations of the General Plan and Zoning Code, it is unlikely that development other than permitted use will occur within the Mill Creek floodplain. Accordingly, the proposed action, combined with other past, present, and reasonably foreseeable future actions, is expected to have a low adverse cumulative effect on floodplains.

3.22.5.7 Water Quality

The study area for water quality is the Mill Creek watershed. Section 3.10 discusses the regulatory setting and existing conditions for water quality.

Current and future developments within the Mill Creek watershed have the potential to increase stormwater runoff into Mill Creek. Any activity that may increase runoff into Mill Creek must be permitted by the State through a Utah Pollutant Discharge Elimination System (UPDES) permit. Mill Creek is not currently listed as a 303(d) impaired water, because its water quality is sufficiently high to meet all its intended uses. The proposed action, combined with other past, present and reasonably foreseeable actions and along with adequate enforcement of State and local water quality regulations, is expected to have a low adverse cumulative effect to water quality in the Mill Creek watershed.

3.22.5.8 Wetlands

The study area for wetlands is the Mill Creek watershed because of the relationship between development activity in the watershed and the role that wetlands play in watershed management. Section 3.12 summarizes the regulatory setting and existing conditions for wetlands within the project study area.

There are many wetlands located in the floodplain of Mill Creek. Wetlands are strictly protected by Section 404(b) of the Clean Water Act, which is administered by the U.S. Army Corps of Engineers. Wetlands support a rich variety of plant species and are an important source of food and habitat for both fish and wildlife. Wetlands provide natural controls for stormwater runoff and water quality, and provide unique and pleasant open spaces in the desert environment.

According to the General Plan, land use proposals that could have adverse impacts on significant wetlands should be modified to eliminate or adequately mitigate such adverse impacts. The City's intent is to preserve from development, as much as practicable, the riparian wetlands that provide important wildlife habitats and scenery that contrasts with the developed areas of the city.

As part of the proposed action, UDOT will mitigate any direct impacts to wetlands. Such mitigation would also be required of any other project in the Mill Creek wetland area. Accordingly, this proposed action, combined with past, present, and a future activity, is likely to have a low adverse cumulative effect on wetlands.

3.22.5.9 Water Bodies

The study area for water bodies is the Mill Creek watershed. A discussion of the regulatory setting and the existing conditions for water bodies within the project study area is included in Section 3.13.

Water bodies within the Mill Creek watershed generally include drainage ditches, small ponds, and Mill Creek. Mill Creek is an important resource for wetlands, wildlife, threatened and endangered species, and recreational uses. The General Plan emphasizes the need for open space in and around the Mill Creek corridor. Because of this, it is unlikely that any new development would have a direct impact on Mill Creek.

The General Plan calls for new development to be setback a minimum of 50 feet from drainage ways and water bodies, both natural and man-made. The plan also states, “Land uses adjacent to plant and animal resources and habitat areas, particularly in association with water courses, water bodies, and potential wetland areas, will be carefully reviewed to minimize the effect of development and encourage habitat preservation.”

The proposed action will mitigate direct impacts to Mill Creek within the project study area. Therefore, this proposed action, in combination with the past, present, and future projects planned within the Mill Creek watershed, is expected to have a low adverse cumulative effect to water bodies.

3.22.5.10 Wildlife

The study area for wildlife is the Mill Creek watershed. There are many species of wildlife that use the Mill Creek watershed for habitat, forage, and breeding. Section 3.14 describes existing conditions for wildlife within the project study area.

The potential cumulative effect of continuing urban development is fragmentation of wildlife habitat or direct habitat loss. Construction of new roads can also fragment or destroy habitat. In the case of the proposed action, which widens an existing roadway within the downtown area, impacts to habitat will be limited and result primarily from construction activities. Construction activities near wildlife habitat, including Mill Creek, could result in mortalities from machinery and temporary displacement of wildlife populations. Furthermore, because Washington City is continuing to grow, there are likely to be projects that cause mortality, habitat loss, habitat fragmentation, and/or displacement of wildlife during construction.

A comprehensive analysis of wildlife and habitat conditions along Mill Creek has not been conducted and is outside the scope of this EA. Therefore, it is difficult to quantify the extent of habitat fragmentation or loss that has occurred in the study area during the last three decades. For the purpose of this EA, even though the impacts of the proposed action to wildlife are expected to be very low, its cumulative effect, in combination with past, present, and future development actions, is expected to moderate and adverse.

3.22.5.11 Threatened and Endangered Species

The study area for threatened and endangered (T&E) species is the Mill Creek watershed. Section 3.15 describes the regulatory setting and existing conditions for T&E species within the project study area.

T&E species face the same potential impacts as wildlife: mortality, habitat loss, habitat fragmentation, and displacement. The General Plan calls for the City to support regional efforts to prevent the destruction of sensitive habitats in order to avoid the listed or threatened species. The Mill Creek watershed is one of these sensitive habitats that need to be protected now and in the future so T&E species remain in the area. The General Plan also assigns a high priority to the protection of important natural resources that are threatened by imminent development.

Given the minor extent of direct impacts in combination with proposed mitigation measures, the proposed action is expected to have a low adverse impact on T&E species. In combination with past, present, and future development actions in the watershed, the cumulative effects of the proposed action are expected to be moderate and adverse.

3.22.5.12 Historic and Archaeological Resources

The study area for historic and archaeological resources is the cumulative area described in Section 3.22.1. The regulatory setting and existing conditions for historic and archaeological resources are described in Section 3.17. No archaeological resources were identified within the project study area.

A common trend in many cities as they begin to grow and develop is that historic buildings are destroyed or possibly relocated to make room for new development. As Washington City continues to grow, historic resources are likely to be affected. Some of these historic resources may be lost forever if they cannot be avoided or relocated. As development moves into agricultural lands, archaeological resources may be discovered that will need to be mitigated.

Any Federal or State action is required to evaluate potential effects to historic and archaeological resources. They are also required to avoid the resource if possible. Private property owners are not subject to these regulations. It is likely that some historic or archaeological resources were lost prior to the enactment of Federal and State regulations. Many developers are now sensitive to the issue of historic and

archaeological resources and take steps to minimize their impacts. According to the General Plan, Washington City believes that their heritage needs to be preserved, and historic buildings are part of that heritage.

Historic buildings and archaeological resources will be avoided where possible and mitigated to minimize impacts where avoidance isn't feasible or practicable. As described in Section 3.17, some historic buildings will be lost as a result of the proposed action. There are also likely to be historic and archaeological resources affected by continuing development and redevelopment in the project study area. In combination with past, present, and future development actions in the area, the proposed action is expected to have a moderate adverse cumulative effect on historic and archaeological resources.

3.22.5.13 Summary of Cumulative Impacts

Table 3.28 summarizes the findings of the cumulative effects evaluation for the identified resources.

Table 3.28 Summary of Potential Cumulative Effects

Potential Impact Area	Proposed Action			Past Actions	Other Present Actions	Future Actions	Cumulative Effect
	Construction	Operation	Mitigation				
Land Use	*	*			*	*	*
Social Issues	*	+			+	+	+
Economics	*	+			+	+	+
Air Quality	*	*		*	*	*	*
Noise	*	**				*	**
Floodplains	*	*			*	*	*
Water Quality	*	*			*	*	*
Wetlands	*				*	*	*
Water Bodies	*				*	*	*
Wildlife	*	*			**	**	**
T&E Species	*	*			**	**	**
Historic Resources	**			*	*	**	**
Key: * low adverse effect ** moderate adverse effect + beneficial effect □ no effect							